Healthfulness Of Life

by: Russ Wilkins and Owen Adams

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HEALTHFULNESS OF LIFE

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A Unified View of Mortality, Institutionalization, and Non-institutionalized Disability in Canada, 1978

by

Russell WILKINS and Owen B. ADAMS

Findings of a joint study undertaken by the Technology and Society Program of The Institute for Research on Public Policy and the Research and Analysis Section of the Health Division, Statistics Canada.

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The Institute for Research on Public Policy
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2149 Mackay Street, Suite 102
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TABLE OF CONTENTS

	Foreword	ix
	Avant-propos	xi
	Acknowledgements	xiii
	The Authors	xv
	List of Figures	xvii
	List of Tables	xix
	Executive Summary	xxiii
	Abrégé	xxxv
Introduction	**Measuring Health Status**	1
	Need for a More Comprehensive Evaluation of Population Health Status	1
	Development of a Comprehensive Index of Population Health Status	3
	Health Expectancy: A Comprehensive, Understandable and Operational Index of Health	4
	Notes	5
Chapter One	**Mortality in the Total Population**	9
	Survivors and Life Expectancy by Age and Sex	12
	Life Expectancy by Region	12
	Life Expectancy by Community Size	14
	Life Expectancy by Income	14
	Notes	17

Chapter Two **Long-Term Institutionalization** 19
Data Sources and Estimation Procedures 19
Institutionalization by Age and Sex 26
Institutionalization by Region and Type of Facility 32
Notes 33
Chapter Three **Activity Restriction in the Household Population** 35
Short-Term Disability 36
Long-Term Disability 37
Categories of Activity Limitation 38
Activity Restriction by Age and Sex 39
Leading Causes of Activity Limitation 40
Comparison with Results of the Canadian Sickness Survey of 1950-51 47
Comparison with Current Rates of Activity Restriction in the United States 47
Notes 53
Chapter Four **Synthesis of the Various Components** 57
Activity Restriction in the Total Population 57
Mortality and Activity Restriction 63
Health Expectancy 68
Quality-Adjusted Life Expectancy 75
Notes 80
Chapter Five **Distribution of Health Expectancy** 81
Health Expectancy by Age and Sex 81
Health Expectancy by Region 88
Health Expectancy by Community Size 92
Health Expectancy by Income 93
Health Expectancy by Local Area 97
Notes 101
Chapter Six **Trends in Health Expectancy and Projections of Activity Restriction** 105
Changes in Health Expectancy from 1951 to 1978 105

	Comparison with Sullivan's Findings for the United States, Mid-1960s	109
	Projections of Activity Restriction	109
	Notes	117
Chapter Seven	**Summary and Conclusions**	119
	Summary	119
	Recommendations	127
	Notes	135
	Bibliography	137
	Appendix	151
	Members of the Institute	
	Institute Management	
	Publications Available	

FOREWORD

One of the unintended consequences of increased longevity and more successful medical intervention has been a dramatic increase in the prevalence of chronic diseases and disability in the population. As the post-war baby boom ages, these problems can only be accentuated. This poses something of a dilemma for health planners because it is not always obvious whether the trade-offs between length and quality of life are resulting in net gain in terms of healthy life. Yet this information is critical for setting priorities and evaluating the effectiveness of health-related programs and policies.

The Healthfulness of Life project, a joint undertaking of Statistics Canada's Health Division and The Institute for Research on Public Policy's Technology and Society Program, was intended to fill a critical information gap. Using data from the Canada Health Survey as well as from health and social services institutions and the vital statistics, researchers Russell Wilkins and Owen Adams have calculated a Canadian index of "health expectancy" (life expectancy in each state of health), and a summary of that index called "quality-adjusted life expectancy." These are the first really meaningful social indicators Canadians have had of the total net output of all our efforts to improve health and increase longevity.

The authors' results are presented by age, sex, region, community size and income. Also shown are their projections to the year 2051 of the effects of Canada's aging population structure on the total volume of disability to be supported.

The Institute hopes that this project report will stimulate debate and further study of the portrait of Canada painted by these social indicators.

Gordon Robertson
President
June 1983

AVANT-PROPOS

La spectaculaire augmentation de la fréquence de maladies chroniques et d'invalidité au sein de la population est une des conséquences non préméditées de l'accroissement de la longévité et du plus grand succès de l'intervention médicale. Ces problèmes ne pourront que s'aggraver avec le vieillissement des enfants du baby boom. Voilà qui place les planificateurs des soins de santé dans un certain dilemme, puisqu'il n'est pas toujours évident que les échanges entre la durée et la qualité de la vie procurent un bénéfice net en termes de santé. Pourtant, il s'agit là d'une information critique pour fixer des priorités, et évaluer l'efficacité des programmes et des orientations en matière de santé.

Le projet sur l'espérance de santé, une collaboration de la Division de la santé de Statistique Canada et du programme d'études technologiques et sociales de l'Institut de recherches politiques, a cherché à combler ce manque critique d'information à l'aide de données provenant de l'Enquête Santé Canada, d'établissements de soins de santé et de services sociaux, et des statistiques de l'état civil. Les chercheurs Russell Wilkins et Owen Adams ont calculé un indice canadien de l' " espérance de santé " (l'espérance de vie selon chaque état de santé) ainsi qu'un condensé de cet indice appelé " espérance de vie pondérée de la qualité ". Il s'agit là pour les Canadiens des premiers vrais indicateurs sociaux du résultat global de l'ensemble de nos efforts en vue d'améliorer la santé et d'accroître la longévité.

Les résultats sont présentés par âge, sexe, région, taille de la communauté et revenu. On présente aussi des projections jusqu'à l'an

2051 des effets du vieillissement de la population canadienne sur le poids du fardeau d'invalidité que nous aurons à supporter.

Gordon Robertson
Président
Juin 1983

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Over the last eight months, many persons have contributed in one way or another to our work on health status indicators. The idea for the Healthfulness of Life project originated with Doug Angus (Chief of Research and Analysis in the Health Division of Statistics Canada), who, along with Zavis Zeman (Director of the Technology and Society Program at The Institute for Research on Public Policy), provided continuing support and encouragement for our research. For their inspiration, advice and helpful criticism, we are particularly grateful to John R. McWhinnie (Department of Indian Affairs and Northern Development), Neil Collishaw (Department of National Health and Welfare), and Madeleine Blanchet (Quebec Ministry of Social Affairs).

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A mid-project panel seminar helped us to clarify our objectives

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While we gratefully acknowledge the contributions of these and other persons too numerous to mention, we are solely responsible for any errors of fact or interpretation that may appear in this report. In particular, support for our research does not imply endorsement of our conclusions either by Statistics Canada or by The Institute for Research on Public Policy.

Russell Wilkins
Montreal

Owen B. Adams
Ottawa

March 31, 1982

THE AUTHORS

Russell Wilkins is a Researcher at the Department of Community Health of the Montreal General Hospital. While undertaking this study, he was a Research Associate with the Technology and Society Program of The Institute for Research on Public Policy. His studies were in anthropology, education and urban planning at the universities of Oregon, Moncton, and Montreal respectively. He is the author of the Institute publications Health Status in Canada, 1926-1976 (1980a), and L'Espérance de vie par quartier à Montréal, 1976 : un indicateur social pour la planification (1979), as well as several articles and reports.

Owen Adams is a Research Analyst in the Research and Analysis Section of the Health Division, Statistics Canada. He did his undergraduate and graduate work in sociology at the University of Western Ontario. He is the author of three catalogued Statistics Canada publications: Health and Economic Activity (1981), Marriage, Divorce and Mortality (with D. Nagnur, 1981), and Retirement and Mortality (with L.A. Lefebvre, 1980).

LIST OF FIGURES

Figure 1.1 Survivors by age and sex, Canada, 1978 10
Figure 2.1 Long-term institutionalization, Canada, 1978 27
Figure 3.1 Activity restriction in the household population, Canada, 1978 41
Figure 3.2 Health problems of persons with activity limitation in the household population, Canada, 1978-79 44
Figure 4.1 Activity restriction in the total population, Canada, 1978 58
Figure 4.2 Disparities in activity restriction, by sex, region, community size, income and local area, Canada, late 1970s 62
Figure 4.3 Health status of survivors, by age and sex, Canada, 1978 66
Figure 4.4 Health expectancy at birth, by sex, Canada, 1978 72
Figure 5.1 Health expectancy by age and sex, Canada, 1978 82
Figure 5.2 Health expectancy by region, by sex, Canada, 1978 85
Figure 5.3 Health expectancy by community size, by sex, Canada, late 1970s 89
Figure 5.4 Health expectancy by income level, by sex, Canada, 1978 96

Figure 6.1 Health expectancy at birth, by sex, Canada, 1951 and 1978 106

Figure 6.2 Projected total volume of activity restriction, Canada, 1978-2051 112

Figure 7.1 Activity restriction in the total population, by sex, Canada, 1978 120

Figure 7.2 Disparities in health expectancy, by sex, region, community size, income level and local area, Canada, late 1970s 123

LIST OF TABLES

Table 1.1	Survivors and remaining life expectancy, by age and sex, Canada, 1978	11
Table 1.2	Life expectancy at birth, by sex, by region, Canada, 1951-1978	13
Table 1.3	Life expectancy at birth and at age 65, by sex, by community size, Canada, 1976	15
Table 1.4	Life expectancy at birth and at age 65, by sex, by income level, metropolitan areas of Canada, 1971	16
Table 2.0	Long-term institutionalization for purposes of health care: summary definitions and number of residents in each category, Canada, 1978	20
Table 2.1	Long-term institutionalization, by type of facility, by age and sex, Canada 1978	28
Table 2.2	Long-term institutionalization, by type of facility, by region, Canada 1978	30
Table 3.1	Activity restriction in the household population, by severity of restriction, by age and sex, Canada, 1978	42
Table 3.2	Main health problem of persons with activity limitation in the household population, by sex, Canada, 1978	45

Table 3.3	Disability by age and sex in the Canadian Sickness Survey of 1950-51, compared to that in the Canada Health Survey of 1978-79; and life expectancy by age and sex in Canada, 1951 and 1978	48
Table 3.4	Activity restriction in the household population, by severity of restriction, by age and sex, United States, 1978, and Canada, 1978	50
Table 4.1	Activity restriction in the total population, by severity of restriction, by age and sex, Canada, 1978	60
Table 4.2	Disparities in activity restriction, by sex, region, community size, income and local area, Canada, 1978	64
Table 4.3	Procedures for the calculation of health expectancy	69
Table 4.4	Health expectancy at birth, by sex, Canada, 1978	73
Table 5.1	Health expectancy by age and sex, Canada, 1978	83
Table 5.2	Health expectancy by region, by sex, Canada, 1978	86
Table 5.3	Health expectancy by community size, by sex, Canada, late 1970s	90
Table 5.4	Health expectancy by income level, by sex, Canada, 1978	98
Table 5.5	Health expectancy and social class indicators, by local area, Montreal, late 1970s	100
Table 6.1	Health expectancy at birth, by sex, Canada, 1951 and 1978	107
Table 6.2	Total volume of activity restriction, by age and sex, Canada, 1978, and projections from 1991 to 2051	113
Table 6.3	Total volume of activity restriction, by type of restriction, by sex, Canada, 1978, and projections from 1991 to 2051	115

Table 7.1 Functional health status of the population, and life expectancy at birth in each of the various states of health, Canada, 1978 121
Table 7.2 Distribution of health expectancy in Canada, by sex, late 1970s 124

EXECUTIVE SUMMARY

Are Canadians healthier now than they were fifteen years ago—or less so? Average life expectancy is increasing, that much is clear, but what about the amount of sickness and disability in the population? Surely healthfulness implies not only survival, but also a certain quality of life.

While time series data for Canada are lacking, in the United States data from the annual Health Interview Survey show that reported long-term disability in the non-institutionalized American population increased by 25 per cent from 1966 to 1976. Of course, that was a time of improved sick-leave benefits and more widespread coverage by hospital and medical insurance. It was also a time of deinstitutionalization for the mentally ill, which added to the number of functionally disabled persons in the household population covered by the survey. Nevertheless, the trend is disquieting, and throws into question more optimistic assessments of changes in population health status based solely on improved life expectancy.

In Canada, despite massive expenditures on health-care services—currently over 7 per cent of Gross National Product—information on the amount of sickness and disability in the general population has been collected only twice: in 1950-51 for the Canadian Sickness Survey, then not again until 1978-79 for the Canada Health Survey. Data on the operation of government-funded health-care services, on the other hand, are collected regularly.

Activity Restriction

In 1978, out of a population of 23 million persons, an average of 214 000 Canadians were long-term residents of institutions for purposes of health care. Three quarters of these (156 000) were living in special-care facilities such as homes for the aged, retarded or physically handicapped. Most of the rest were in hospital chronic-care units (47 000) or, less frequently, in mental hospitals (11 000).

When residents of hospitals, mental hospitals and special-care facilities are considered together, rates of long-term institutionalization varied little from region to region in Canada. The distribution of the institutionalized population among the various categories of long-term health-care facilities, however, varied widely among the regions.

For Canada as a whole, 73 per cent of long-term institutionalization occurred in special-care facilities such as homes for the aged, but the range was from 51 per cent in Quebec to 86 per cent in the Atlantic region. Long-stay hospital units accounted for only 4 per cent of institutionalization in the Atlantic region, but no less than 48 per cent in Quebec. On the other hand, residents of mental hospitals, which included but 1 per cent of the institutionalized population in Quebec, formed 10 per cent of the total institutionalized in the Atlantic region.

This lack of regional similarity in the distribution of the institutionalized population among the various categories of facilities points up the extent to which placement of a patient in one category of facility or another depends on factors other than the patient's state of health. The dissimilarity among regions underscores the danger of trying to make inferences about population health status based on institutional data—or worse yet, based on institutional data for only one or two categories of facilities. Patterns of institutionalization by type of facility appear to reflect regional traditions and provincial health policies much more than they do any imperatives in underlying needs or requirements for care.

In addition to the 214 000 persons (0.9 per cent of the population) who were long-term residents of health-care institutions, nearly half a million Canadians (2.1 per cent), while not institutionalized, suffered from health problems that left them chronically unable to work, attend school or keep house. Another 1.7 million (7.1 per cent) were somewhat restricted in the kind or amount of these major activities that they were able to perform. Half a million persons (2.2 per cent), although not limited in terms of work, school or housework, reported health problems that usually restricted them in terms of other activities such as recreational or community functions. Finally, on an average day, yet another half million otherwise healthy persons (2.0 per cent) were temporarily disabled by illness (such as colds, flus or other common ailments) or accident.

When activity restriction was examined in relation to age and when disabled persons living at home as well as those living in institutions were included in the results, the overall picture was one of increasing limitation of activity with advancing age, both in terms of the percentage of population affected and in terms of the severity of disability experienced. Still, in each age group below the highest (75 and over), no more than one tenth of the population was to be found in the two most severe categories of disability. At age 75 and over, however, nearly one quarter of Canadians were either institutionalized or otherwise unable to do their major activity. Another one quarter of Canadians aged 75 and over reported less severe long-term or short-term activity restrictions.

Rates of institutionalization were considerably higher for women than for men aged 75 and over. This was due, in part, to the fact that elderly men were more likely than elderly women to have a surviving spouse capable of providing them with basic care. If their health became impaired, it was thus easier for men than women to continue living at home.

In the non-institutionalized population, men were much more likely than women to report being completely unable to do their major activity, while women were more likely to report being only restricted in their ability to do their major activity. However, the percentages of men and women in the household population who reported being either restricted in, or completely unable to do, their major activity were quite similar at all ages.

In so far as comparisons between the American and the Canadian health surveys are possible, it appears that the current prevalence of disability in Canada is lower than that reported recently in the United States. This applies to all categories of disability in the household population for most age groups of both sexes. Nevertheless, because of the aging of the large post-war baby-boom generation, the amount of activity restriction in the Canadian population may be expected to increase substantially in the future. This will have numerous implications for the organization and financing of health-care and social services.

Because chronic disability is so much more likely to occur among the elderly, any increase in the size of this age group increases the total amount of disability far more than might be expected on the basis of population alone. Under the fairly unlikely assumption that rates of disability at each age remain unchanged well into the next century, the percentage of population institutionalized is projected to nearly double over the next fifty years. Because of the high public expenditures and manpower requirements of institutional care, it is not hard to foresee the need for careful planning as well as for better organization and financing in this area. Over the same period, the percentage of total population not institutionalized but unable to do or restricted in their major activity would increase by half. One cannot help but wonder how the implied increase in need for home-care services will be handled. The inadequacy of such services compared to demand is frequently criticized already.

Health Expectancy

Neither life expectancy statistics nor disability statistics, considered separately, tell the whole story. After all, in so far as chronic illness is more common at advanced ages, a greater amount of disability is one of the natural, perhaps even inevitable, consequences of longer life. Thus, until mortality data are brought together with the data on activity restriction among the living, our view of health is necessarily incomplete.

Health expectancy depends on the probability of surviving to a given age as well as on the likelihood that the survivors will be either free of activity restriction or restricted to a greater or lesser extent.

In its simplest form the health expectancy index takes overall life expectancy and breaks it down into years of disability-free life and years of disabled life. Because the results are expressed in simple and unambiguous terms, they can be of use more easily to non-specialist policy makers and planners, as well as to the general public. Moreover, calculation of the health expectancy index is a straightforward affair based on known techniques similar to those used for the construction of ordinary life tables. All of the basic data required can be obtained from a sample survey of disability in the household population, together with estimates concerning persons living in institutions and data on mortality in the general population. Because of these desirable properties, and because its limitations are well understood, the health expectancy index has often been suggested as a model for Canadian health planning and policy analysis.

Based on estimates of activity restriction from the Canada Health Survey, institutional data on long-term care, and survival data from the vital statistics, we calculated the number of years of life expectancy in each of six states of health. For Canadians at birth in 1978, expected years of long-term institutionalization were 0.8 for men, and 1.5 for women. Expected years of activity restriction not involving institutionalization were 10.8 for men, and 14.0 for women, of which 3.0 for men and 1.3 for women were in the most severe category (unable to do major activity). While women outlived men by 7.5 years, that difference was reduced by half if only years free of any health-related activity restriction were considered.

Part of the reason for the greater disability expectation of women was that more women than men survived to the advanced ages when most forms of activity restriction became common. Clearly, there was a trade-off of sorts between greater length of life and somewhat reduced health status. Death undoubtedly eliminated many men who, had they survived, might well have been impaired and perhaps institutionalized.

We also analysed the demographic, regional, and social dimensions of health expectancy in Canada in terms of overall life expectancy, life free of activity restriction (disability-free life), and a summary of the two, quality-adjusted life expectancy. Quality-adjusted life expectancy was calculated by applying arbitrarily assigned weights* to the number of expected years in each state of health, and then summing the products. Of the three indicators, quality-adjusted life expectancy best summarized health expectancy in terms of both quality and quantity.

For both males and females at birth, quality-adjusted life expectancy amounted to over 90 per cent of total life expectancy. Even at age 65, quality-adjusted life expectancy was no less than 80 per cent of remaining life expectancy for both sexes, although by that age nearly half of all remaining years were expected to be lived with at least some degree of activity-limiting health impairment.

While much political discussion in Canada revolves around questions of regional disparities among provinces or groups of provinces, it is clear from our findings that in terms of health status, at least, such differences were of far less importance than those types of disparities that cut across each of the provinces and regions. For both sexes together, quality-adjusted life expectancy was 1.4 years greater in Ontario and the Prairies than in the Atlantic region, but 3.2 years greater in Canada's three largest cities than in rural areas and small towns, and 7.7 years greater among persons from high-income families compared to persons from low-income families.

In terms of quality-adjusted life expectancy, the healthiest regions of Canada were the Prairies, which combined long life with only moderate amounts of disability, and Ontario, which combined fairly long life with little disability. Third and fourth places in terms of quality-adjusted life expectancy went to Quebec and British Columbia respectively. (While Quebecers had the shortest overall life expectancy, this was partially compensated for by the least reported disability. British Columbians had a longer life expectancy, but at the expense of considerably more disability than other Canadians.) The Atlantic provinces ranked lowest among Canadian regions in terms of quality-adjusted life expectancy, due to lower-than-average life expectancy combined with higher-than-average disability.

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*The weights used were as follows: long-term institutionalization, 0.4; cannot do major activity, 0.5; restricted in major activity, 0.6; minor activity restriction, 0.7; only short-term disability, 0.5; not restricted in activities, 1.0.

Quality-adjusted life expectancy was lowest in rural areas (67.4 years), about a half-year greater than that in communities of one to ten thousand persons (68.0), another half-year greater in communities of ten thousand to one million population (68.5), and yet another two years higher in Canada's three largest cities (70.6). This pattern of variation was probably due to a number of factors such as the income, education and occupation of residents, differing levels of services available, and a tendency to self-selection of populations by migration among the areas. An examination of community-size differences in causes of death, and in the severity and causes of disability, while beyond the scope of this report, would be most useful in helping to sort out the relative importance of the various factors underlying these findings. Such information could then be used in attempting to reduce the observed disparities that were clearly unfavourable to residents of smaller communities and rural areas.

Although comprehensive government-administered health insurance plans have made medical and hospital care available as a right to all Canadians since the late 1960s, this in no way means that socio-economic-based disparities in health status have been eliminated. Our results show that healthfulness of life was directly related to income. Whether the measure was overall life expectancy, disability-free life, or quality-adjusted life expectancy, the pattern was similar: the poorer you were, the less healthy you were likely to be—over a shorter lifetime. Moreover, income-related disparities in health status were compounded, rather than diminished, when disability was taken into account as well as overall life years. Between the highest and lowest income levels, the disparity in overall life expectancy was 4.5 years. This disparity rose to 7.7 years after adjustment for the quality of those life years in terms of the expectation of disability. Where data were available, a similar pattern could also be seen among neighbourhoods at the local level.

We have examined the distribution of health expectancy in Canada by age and sex, region, community size and income. Health services, however, are administered by provincial authorities who typically delegate much of their responsibility for population health status to sub-provincial or local administrative units, such as local boards of health in Ontario, departments of community health in Quebec, and regional health districts in British Columbia. Unfortunately, the sample size of the Canada Health Survey was not large enough to permit accurate estimates of disability in the household population for each province in the Atlantic and Prairie regions, nor of sub-provincial areas within the larger provinces.

If, in the future, national health surveys are repeated on a regular basis, the accumulation of data on disability over a period of two or three years would allow estimates of health expectancy to be made for all provinces as well as for major sub-provincial regions within the larger provinces. Still, health status in local areas is frequently quite different from provincial or regional averages. Specific surveys of local areas are the only way to determine how they compare to the larger units.

According to the Organisation for Economic Co-operation and Development, establishing ways of linking expected years of healthy life and expected years of disability to causes of death and disability would be a crucial step in demonstrating the usefulness of social indicators for policy planning and evaluation. While extending the analysis of health expectancy in this way seems feasible in principle, the practical difficulties (of matching self-reported activity restrictions from household surveys to physician-reported causes of death from the vital statistics) and additional data requirements (for causes of disability of residents of institutions other than hospitals) should not be overlooked. Nevertheless, a combined analysis taking into consideration both causes of death and causes of disability would permit the ranking of health problems according to their overall impact on health expectancy, including loss of functional ability as well as loss of life itself. This might well lead to major changes in the relative priority accorded to each cause—with all the implications for health planning and policy making which that would entail.

Knowledge of changes over time in health expectancy is fundamental to any evaluation of social progress or decline. Are

Canadians healthier now than in the past? For Canada as a whole, from 1951 to 1978, average length of life increased substantially, but the prevalence of activity restriction in the population also increased. On balance, however, even after discounting gains due to increased disability, it appears that real progress has indeed been made. In terms of quality-adjusted life expectancy, males in 1978 had an additional three years, and females, an additional six years, compared to 1951.

But what about more recent trends? Over the last ten or fifteen years, since the introduction of universal medical and hospital insurance, what has happened to health expectancy? The answer is that we simply do not know, nor can we know, since the basic data on disability in the household population were never collected. As far as trends in Canada since 1978 are concerned, these will also be impossible to determine, unless surveys of population health status are repeated at regular intervals.

Information Requirements

Health data collection should be designed not only to monitor health status, but also to determine the extent and distribution of unmet needs relating to long-term disability and activity limitation. This type of information is essential to policy makers charged with the difficult task of translating health-related objectives into concrete programs of action.

While Canada boasts a highly efficient system of universal medical and hospital services, comparable services for the chronically ill or functionally disabled tend to be lacking. According to the House of Commons Select Committee on the Disabled and Handicapped (Canada, 1981, p. 6), "In comparison with the efforts being made in other countries, Canada shows poor progress in assisting disabled persons in the areas of employment opportunities, income security, community support services, and technical aids."

The Canadian Sickness Survey of 1950-51 provided many of the hard facts supporting arguments in favour of legislation establishing the universal hospital and medical care plans of the mid-to-late 1960s. These mainly provided hospital-based acute-care treatment and office-based professional services, while largely ignoring needs for other types of care. As a logical extension of past accomplishments, the results of the Canada Health Survey of 1978-79 and of the future surveys proposed above should now contribute to informed public debate relating to ways of assuring appropriate care for persons with long-term disabilities and chronic illnesses not necessarily requiring institutionalization or office-based professional treatment.

While a great deal of health-related data is now collected, it is not always well suited to these objectives, nor is it ordinarily put together in such a fashion as to permit the kind of comprehensive evaluation needed. In addition, one of the main data elements needed for the evaluation of health status in Canada is once again missing—that concerning disability in the household population. This lack of data from periodic health surveys of the general population (as opposed to administrative statistics on those receiving insured services) in turn reduces or destroys the potential value of much of the other routinely collected information, such as that related to the operation of the health-care system.

If health goals are to be explicitly formulated and progress towards them monitored over time as a way of evaluating the success of health-related programs and policies, it is absolutely essential to have relevant and timely information on the state of health of the Canadian population as a whole, rather than just on the relatively small number of cases in which institutionalization or other insured professional services are received. Nothing less than a periodic survey of the health of Canadians will suffice.

We take for granted that the principal objective of health and social services programs is to ensure optimal health and social functioning for all Canadians. This implies the utilization of available resources in the most efficient manner possible for the good of society as a whole. The problem is, of course, how to know when this laudable goal is, in fact, being accomplished. We suggest that, if agreement could be reached that the primary objective is to maximize the number of expected years of healthy life, then progress towards this goal could be determined by reference to some sort of quality-adjusted life expectancy index, possibly along the lines presented above.

By explicitly valuing successful efforts to minimize functional disability as well as loss of life, this indicator would correspond closely to commonly perceived notions of health needs, and at the same time permit an objective assessment of success or failure in relation to those objectives. The "bottom line" for health planning would at last be expressed in terms of final outputs, rather than simply in terms of intermediate inputs or expenditures. The basis of a system of social accounting would have been laid—a pre-condition for maintaining or increasing the long-term efficiency and effectiveness of efforts aimed at improving the healthfulness of life.

ABRÉGÉ

Les Canadiens sont-ils plus ou moins en santé maintenant qu'ils ne l'étaient il y a 15 ans? Certes, l'espérance de vie augmente; mais qu'en est-il de la maladie et de l'invalidité? La santé n'est pas tout simplement la survie : elle implique aussi une certaine qualité de vie.

Même si on manque de données de séries chronologiques pour le Canada, aux États-Unis, les données de la Health Interview Survey annuelle indiquent que les invalidités de longue durée chez les Américains vivant hors des établissements a augmenté de 25 % de 1966 à 1976. Cette période correspond évidemment à une époque d'amélioration des prestations de maladie, et d'augmentation des garanties des assurances hospitalisation et des assurances médicales. Cette époque a aussi été marquée par une sortie des établissements des malades psychiatriques, ce qui a provoqué une augmentation du nombre des invalides fonctionnels dans les ménages visés par l'enquête. Il demeure toutefois que cette tendance est inquiétante et met en question les évaluations plus optimistes des changements de la situation de santé de la population fondées uniquement sur l'amélioration de l'espérance de vie.

Au Canada, et ce malgré les dépenses colossales sur les services de santé – qui s'élèvent actuellement à plus de 7 % du Produit national brut, – on n'a amassé que par deux fois des renseignements sur l'état de santé et d'invalidité de la population en général : en 1950-1951 pour l'Enquête sur la maladie au Canada et ensuite seulement en 1978-1979 pour l'Enquête Santé Canada. On recueille toutefois régulièrement des

données sur le fonctionnement des services de soins de santé financés par l'État.

La restriction des activités

En 1978, une moyenne de 214 000 Canadiens sur une population totale de 23 millions étaient résidents à long terme d'établissements de soins de santé. Les trois quarts de ce nombre (156 000) logeaient dans des établissements de soins spécialisés tels que des centres d'accueil, des maisons pour personnes arriérées ou des foyers pour personnes handicapées. La plupart des autres étaient soit dans les services pour malades chroniques des hôpitaux (47 000), soit, moins souvent, dans des hôpitaux psychiatriques (11 000).

Lorsqu'on considère globalement les résidents d'hôpitaux, d'hôpitaux psychiatriques et d'établissements de soins spécialisés, les taux de placement à long terme en établissement variaient très peu d'une région à l'autre du Canada. Toutefois, la répartition de la population placée en établissement entre les diverses catégories d'établissements pour malades chroniques variaient énormément d'une région à l'autre.

Pour l'ensemble du Canada, 73 % des personnes hospitalisées à long terme se trouvaient dans des établissements de soins spécialisés tels que les centres d'accueil, mais cette proportion variait de 51 % au Québec à 86 % dans les Maritimes. Les services de malades chroniques des hôpitaux n'accueillaient que 4 % des personnes hospitalisées dans la région atlantique, tandis que cette proportion était de 48 % au Québec. Par contre, tandis que les résidents d'hôpitaux psychiatriques ne représentaient que 1 % du total de la population hospitalisée au Québec, ils représentaient 10 % du total dans la région atlantique.

Ce manque d'équilibre régional dans la répartition de la population des établissements entre les diverses catégories d'installations met en relief à quel point le placement d'un patient dans une catégorie d'établissement ou l'autre relève de facteurs autres que son état de santé. Ce déséquilibre entre les régions vient souligner le danger de tenter d'extrapoler au sujet de la santé de la population à partir des données sur les établissements — ou pis encore, à partir des données sur les établissements établies en fonction de seulement une ou deux catégories. Les profils d'hospitalisation par type d'établissement semblent témoigner de traditions régionales et de politiques provinciales de santé beaucoup plus que des impératifs imposés par les exigences ou les besoins sous-jacents de soins.

Outre les 214 000 personnes (0,9 % de la population) qui étaient résidentes à long terme d'établissements de soins de santé, on comptait près d'un demi million de Canadiens (2,1 %) qui, bien que non hospitalisés, connaissaient des problèmes de santé qui les laissaient inaptes à travailler, à aller à l'école ou à tenir maison. Un autre 1,7 million (7,1 %) ne pouvaient exercer leurs activités que de façon limitée, tandis que 500 000 personnes (2,2 %), bien que non limitées en termes de travail, d'instruction ou de travail de maison, déclaraient souffrir de problèmes de santé qui limitaient leurs autres activités, telles que les loisirs ou les activités communautaires. En dernier lieu, au cours d'une journée typique, un autre demi million de personnes, par ailleurs en santé (2 %), souffraient d'une invalidité temporaire occasionnée par une maladie (telle qu'un rhume ou une grippe) ou un accident.

Lorsqu'on examine la restriction des activités en rapport avec l'âge et lorsqu'on tient compte à la fois des personnes invalides demeurant à la maison et de celles résidant en institution, on constate une augmentation de la limitation des activités avec l'âge, tant en termes de pourcentage de la population affectée qu'en termes de la gravité des infirmités. Néanmoins, dans chaque groupe d'âge en-deçà du groupe le plus élevé (75 ans et plus), on trouvait au maximum 10 % de la population dans les deux catégories d'infirmités les plus graves. Dans le groupe de 75 ans et plus, cependant, près du quart des Canadiens étaient soit dans des établissements ou incapables de s'adonner à leur principale activité. Un autre 25 % des Canadiens de plus de 75 ans déclaraient connaître des limites un peu moins prononcées, à long ou à court terme, de leurs activités.

Dans le groupe des 75 ans et plus, le taux d'hospitalisation était sensiblement plus élevé pour les femmes que pour les hommes. Cela venait en partie du fait que les hommes âgés risquaient davantage que les femmes âgées d'avoir un conjoint capable d'assurer leurs soins élémentaires. En cas de maladie, il était donc plus facile pour les hommes que pour les femmes de demeurer à la maison.

Dans la population vivant hors des établissements, les hommes étaient beaucoup plus susceptibles que les femmes de déclarer être tout à fait incapables de s'adonner à leur principale activité, tandis que les femmes étaient plus susceptibles de déclarer n'être que limitées dans leur aptitude à s'adonner à leur principale activité. Toutefois, les pourcentages d'hommes et de femmes dans la population à la maison qui déclaraient être soit limités dans leur activité principale, soit incapables de s'y adonner étaient fort semblables pour tous les âges.

Dans la mesure où l'on peut comparer les enquêtes sur la santé au Canada et aux États-Unis, il semble que la fréquence d'invalidité au Canada soit moins élevée que celle rapportée aux États-Unis. Cela s'applique à toutes les catégories d'invaladités dans la population à la maison pour la plupart des groupes d'âges des deux sexes. Toutefois, en raison du vieillissement de l'importante population du baby boom, on peut prévoir que l'ampleur de la restriction des activités dans la population canadienne s'accroisse sensiblement à l'avenir. Cette situation recèle de nombreuses implications pour l'organisation et le financement des services sociaux et des services de soins de santé.

Puisque l'invalidité chronique risque de se retrouver bien davantage chez les personnes âgées, toute augmentation de l'importance de ce groupe d'âge entraîne une augmentation de l'invalidité beaucoup plus élevée que celle à laquelle on pourrait s'attendre en fonction uniquement d'augmentation de la population. Même compte tenu de l'hypothèse assez peu probable voulant que les taux d'invalidité à chaque âge demeurent les mêmes longtemps au cours du prochain siècle, le pourcentage de la population dans les établissements devrait presque doubler au cours des cinquante prochaines années. Étant donné les fortes dépenses et le nombre élevé d'employés qu'exigent les soins en établissement, il est facile de prévoir le besoin d'une planification avisée ainsi que d'une meilleure organisation et d'un meilleur financement en ce domaine. Au cours de la même période, le pourcentage total des personnes hors des établissements mais incapables de s'adonner à leur activité principale ou limitées dans cette dernière augmentera de moitié. On ne peut que se demander comment l'on répondra à cette augmentation de la demande de soins à la maison. On critique déjà les insuffisances de tels services par rapport à la demande.

L'espérance de santé

On ne peut cependant obtenir un portrait complet en considérant séparément les statistiques sur l'espérance de vie ou sur l'invalidité. Après tout, dans la mesure où les maladies chroniques surviennent plus souvent au cours de la vieillesse, l'augmentation de l'invalidité est une des conséquences naturelles et peut-être inévitables d'une vie plus longue. On ne peut donc obtenir une perspective complète de la santé tant qu'on n'aura pas combiné les données sur la mortalité avec celles sur la restriction de l'activité chez les personnes vivantes.

L'espérance de santé dépend de la probabilité de survivre jusqu'à un certain âge ainsi que des chances que les survivants soient libres d'exercer leur activité ou limités dans une plus ou moins grande mesure. Sous sa forme la plus simple, l'indice d'espérance de santé ventile l'espérance de vie globale en années de vie sans invalidité et de vie invalide. Puisque ces résultats sont exprimés en termes simples et précis, les décideurs et les planificateurs ainsi que le public non spécialisé peuvent les utiliser plus facilement. En outre, le calcul de l'indice d'espérance de santé est un travail sans mystère basé sur des techniques connues semblables à celles utilisées pour la construction des tables de vie courante. On peut obtenir toutes les données nécessaires dans une enquête témoin de l'invalidité dans la population des ménages ainsi qu'à partir d'évaluations des personnes en établissement et de données sur la mortalité dans la population en général. Étant donné ses propriétés désirables et puisque ses limites sont bien connues, on a souvent proposé l'indice d'espérance de santé comme modèle pour la planification et l'analyse de la politique en matière de santé au Canada.

Nous avons calculé le nombre d'années d'espérance de vie pour six états de santé à partir des évaluations de la restriction de l'activité de l'Enquête Santé-Canada, des données des établissements sur les soins prolongés et sur les données sur la survie des statistiques de l'état civil. Pour les Canadiens de naissance en 1978, les années prévues d'institutionalisation à long terme étaient de 0,8 pour les hommes et de 1,5 pour les femmes. Les années prévues de restriction de l'activité ne comportant pas d'institutionalisation étaient de 10,8 pour les hommes et de 14,0 pour les femmes, dont 3,0 pour les hommes et 1,3 pour les femmes dans la catégorie la plus grave (incapable de s'adonner à l'activité principale). Même si les femmes vivaient 7,5 années de plus que les hommes, cette différence chutait de moitié si l'on ne tenait compte que des années libres de toute restriction de l'activité pour des raisons de santé.

Cette plus forte prévision d'invalidité chez les femmes s'explique en partie par le fait que plus de femmes que d'hommes survivent jusqu'à un âge avancé, au moment où la plupart des formes de restriction de l'activité se manifestent. Il est donc évident qu'une vie plus longue s'accompagne dans une certaine mesure d'une réduction de la santé. La mort a sans doute éliminé plusieurs hommes qui, s'ils avaient survécu, auraient été invalides ou hospitalisés.

Nous avons aussi analysé les dimensions démographiques, régionales et sociales de l'espérance de vie au Canada en termes d'espérance de vie globale, de vie libre de restriction de l'activité (vie libre d'invalidité) et d'un résumé des deux, l'espérance de vie pondérée de la qualité. L'espérance de vie pondérée de la qualité a été calculée à l'aide de pondérations[1] appliquées arbitrairement au nombre d'années de vie prévu pour chaque état de santé : on a ensuite additionné les produits. Parmi les trois indicateurs, c'est l'espérance de vie pondérée de la qualité qui résume le mieux l'espérance de santé en termes à la fois de qualité et de quantité.

Qu'il s'agisse des hommes ou des femmes à la naissance, l'espérance de vie pondérée de la qualité expliquait plus de 90 % de l'espérance de vie globale. Même à 65 ans, l'espérance de vie pondérée de la qualité expliquait pas moins de 80 % de l'espérance de vie chez les deux sexes, bien qu'à cet âge, on s'attendait que près de la moitié des années à vivre comportent à tout le moins un certain degré de problèmes de santé limitant l'activité.

Bien qu'une bonne part du débat politique au Canada tourne autour des questions de disparités régionales entre les provinces ou entre les groupes de provinces, nos résultats démontrent clairement que, du moins en ce qui a trait à l'état de santé, de telles différences sont beaucoup moins importantes que les disparités qui recoupent chacune des provinces et des régions. Pour les deux sexes pris ensemble, l'espérance de vie pondérée de la qualité était de 1,4 années plus élevée en Ontario et dans les Prairies que dans les Maritimes, mais de 3,2 années plus élevée dans les trois plus grandes villes du Canada que dans les régions rurales et dans les petites villes, et de 7,7 années plus élevée chez les personnes de familles à revenu élevé que chez les personnes de familles à faible revenu.

En termes d'espérance de vie corrigée de la qualité, les régions les plus en santé du Canada étaient les Prairies, qui réunissaient une longue vie et une invalidité modérée, et l'Ontario, qui réunissait une vie assez longue et peu d'invalidité. Les troisième et quatrième places allaient respectivement au Québec et à la Colombie-Britannique. (Chez les Québécois, le taux d'invalidité le moins élevé compensait l'espérance de vie globale la plus faible. Les habitants de la Colombie-Britannique avaient une espérance de vie plus élevée mais aux dépens d'un taux d'invalidité passablement plus élevé que celui des autres Canadiens.) Les provinces de l'Atlantique se classaient les dernières parmi les régions canadiennes en termes d'espérance de vie pondérée de la qualité en raison d'une espérance de vie moins élevée que la moyenne combinée à un taux d'invalidité plus élevé que la moyenne.

C'est dans les régions rurales que l'espérance de vie pondérée de la qualité était la plus faible (67,4 années); elle était d'environ six mois de plus dans les communautés de 1 000 à 10 000 personnes (68,0), un autre six mois de plus dans les communautés de 10 000 à 1 000 000 de personnes (68,5) et deux ans de plus dans les trois plus grandes villes du Canada (70,6). Ce profil de variation dépend probablement d'un certain nombre de facteurs tels que le revenu, l'instruction et la profession des habitants, les divers niveaux de services offerts et une tendance à l'autosélection des populations par une migration d'une région à l'autre. Un examen des différences entre les communautés de diverses tailles en ce qui a trait aux causes de la mort, et à la gravité et aux causes de l'invalidité, bien qu'il dépasse le cadre de ce rapport, serait fort utile pour départager l'importance relative des divers facteurs qui sous-tendent ces résultats. De tels renseignements pourraient ensuite servir à réduire les disparités observées qui révélaient un désavantage pour les habitants des petites communautés et des régions rurales.

Bien que, depuis la fin des années 1960, les Canadiens aient tous accès aux soins médicaux et hospitaliers grâce aux régimes complets d'assurance santé administrés par les gouvernements, cela ne veut aucunement dire que les disparités socio-économiques en matière de santé ont été éliminées. Nos résultats indiquent un rapport direct entre la santé et le revenu. Qu'il s'agisse de l'espérance de vie globale, d'une vie libre d'invalidité ou de l'espérance de vie pondérée de la qualité, le profil est semblable : plus on est pauvre, plus on risque d'être malade – et de vivre moins longtemps. En outre, lorsqu'on prend en compte l'invalidité en plus du nombre d'années de vie, les disparités de l'état de santé reliées au revenu deviennent encore plus prononcées. L'écart entre l'espérance de vie globale du revenu le plus haut et du revenu le plus bas était de 4,5 années. Cet écart passait à 7,7 années après ajustement pour la qualité de ces années de vie en termes de l'espérance d'invalidité. On peut remarquer un profil semblable, dans la mesure où l'on dispose de données, entre les quartiers dans les villes.

Nous avons examiné la répartition de l'espérance de santé au Canada par âge et par sexe, par région, par taille de collectivité et par revenu. Cependant, les services de santé sont administrés par les autorités provinciales qui délèguent habituellement une bonne part de leurs responsabilités en matière de santé à des services administratifs subalternes ou locaux tels que les conseils de santé en Ontario, les services de santé communautaire au Québec et les districts régionaux de santé en Colombie-Britannique. Malheureusement, la taille de l'échantillon de l'Enquête Santé Canada ne permettait pas d'évaluer avec précision l'invalidité dans les ménages pour chaque province des Maritimes et des Prairies ni des régions à l'intérieur des plus grandes provinces.

Si, à l'avenir, on répétait périodiquement des enquêtes nationales sur la santé, l'accumulation des données sur l'invalidité au cours d'une période de deux ou trois années permettrait d'évaluer l'espérance de santé pour toutes les provinces ainsi que pour les plus importantes régions à l'intérieur même des plus grandes provinces. Il reste que l'état de santé dans certaines localités est souvent fort différent de la moyenne pour la province ou pour une région. Des enquêtes visant des localités précises offrent le seul moyen d'établir des comparaisons avec des plus grands ensembles.

Selon l'Organisation de coopération et de développement économiques, l'élaboration de méthodes pour établir des liens entre les années prévues de vie en santé et les années prévues d'invalidité d'une part, et des causes de décès et d'invalidité d'autre part constituerait une étape décisive dans la démonstration de l'utilité des indices sociaux pour l'élaboration et l'évaluation des politiques. Bien qu'il semble possible en principe d'étendre la portée de l'analyse de l'espérance de santé dans cette direction, il ne faudrait pas oublier les difficultés pratiques (comparer les déclarations relatives à la restriction d'activité tirées des enquêtes auprès des ménages et les causes de mortalité des statistiques de l'état civil rapportées par les médecins) et les besoins supplémentaires de données (sur les causes d'invalidité des résidents d'établissements autres que les hôpitaux). Il reste cependant qu'une analyse combinée qui tiendrait compte à la fois des causes de mortalité et des causes d'invalidité permettrait de classer les problèmes de santé en fonction de leur influence globale sur l'espérance de santé, y compris la perte de capacités fonctionnelles ainsi que la perte de vie comme telle. Cela pourrait bien entraîner d'importants changements dans la priorité relative accordée à chaque cause — sans compter les implications pour la planification et l'élaboration de la politique en matière de santé.

Toute évaluation du progrès ou du déclin social doit absolument s'appuyer sur une connaissance de l'évolution de l'espérance de santé. Les Canadiens sont-ils plus en santé maintenant que dans le passé? Pour l'ensemble des Canadiens, la durée de vie moyenne a augmenté substantiellement de 1951 à 1978; toutefois, la fréquence de restriction des activités a aussi augmenté. Dans l'ensemble, cependant, même en tenant compte de l'augmentation de l'invalidité, il semble qu'on ait effectué de réels progrès. En termes d'espérance de vie pondérée de la qualité, les hommes avaient gagné trois ans en 1978 et les femmes six ans.

Mais qu'en est-il des tendances plus récentes? Depuis dix ou quinze ans, après l'introduction de l'assurance santé universelle, qu'est-il advenu de l'espérance de santé? Force nous est de dire que nous ne le savons tout simplement pas (et nous ne pouvons le savoir) puisqu'on n'a jamais collecté les données de base sur l'invalidité dans la population des ménages. Quant aux tendances au Canada depuis 1978, elles seront également impossibles à établir à moins de procéder à des enquêtes périodiques sur l'état de santé de la population.

Les besoins d'information

La collecte de données sur la santé devrait viser non seulement à contrôler l'état de santé, mais aussi à déterminer l'ampleur et la répartition de besoins non satisfaits en matière d'invalidité à long terme et de restriction des activités. Les décideurs qui se voient imposer le difficile travail de concrétiser les objectifs en matière de santé ont absolument besoin de ce genre d'informations.

Bien que le Canada puisse se vanter d'avoir un système fort efficace de services médicaux et hospitaliers universels, on manque de services comparables à l'intention des malades chroniques ou des invalides. Comme l'affirme le Comité spécial de la Chambre des Communes concernant les invalides et les handicapés (Canada, 1981, p. 6), " par rapport aux efforts consentis dans d'autres pays, le Canada traîne de la patte dans l'aide aux invalides dans les secteurs de l'emploi, de la sécurité du revenu, des services communautaires et de l'aide technique ".

L'Enquête sur la maladie au Canada de 1950-1951 a fourni les données à l'appui des arguments en faveur de lois qui ont créé les régimes universels d'assurance médicale et d'assurance santé du milieu à la fin des années 1960. Ces régimes ont surtout offert le traitement hospitalier de maladies aigües et les services professionnels de bureau tout en négligeant les besoins d'autres types de soins. Logiquement, suite aux réalisations passées, les résultats de l'Enquête Santé Canada de 1978-1979 et des prochaines enquêtes proposées ci-dessus devraient contribuer à un débat public éclairé sur les moyens d'assurer des soins appropriés aux personnes souffrant d'invalidité à long terme et de maladies chroniques, et n'ayant pas nécessairement besoin de se trouver en établissement ou de subir des traitements professionels au bureau.

Même si l'on collecte actuellement nombre de données relatives à la santé, elles ne sont pas toujours bien adaptées à ces objectifs ou agencées de manière à permettre l'évaluation globale dont on a besoin. En outre, un des principaux éléments nécessaires à une évaluation de l'état de santé au Canada manque toujours – c'est-à-dire les données sur l'invalidité dans la population des ménages. Ce manque de données tirées d'enquêtes périodiques sur la santé de la population en général (par opposition aux statistiques administratives sur les prestataires de services assurés) diminue ou détruit la valeur éventuelle de la plupart des autres renseignements collectés régulièrement tels que ceux qui ont trait au fonctionnement du régime de soins de santé.

Si l'on espère établir clairement des objectifs en matière de santé et contrôler leur réalisation progressive en vue d'une évaluation du succès des programmes et des orientations en matière de santé, il est essentiel de disposer de renseignements pertinents et à jour sur l'état de santé de la population canadienne dans son ensemble plutôt qu'uniquement sur un nombre relativement restreint de cas de personnes en institution ou nécessitant le recours à des services professionnels assurés. Il ne faudra rien de moins que des enquêtes périodiques sur la santé des Canadiens.

Nous prenons pour acquis que le principal objectif des services de santé et des services sociaux est d'assurer la santé et le fonctionnement social optimaux de tous les Canadiens. Cela implique l'utilisation des ressources disponibles de la manière la plus efficace possible pour le bien de la société dans son ensemble. Il reste à savoir évidemment dans quelle mesure nous réalisons ce louable objectif. Nous avançons que, s'il était possible de s'entendre sur le fait que le principal objectif est l'optimisation du nombre d'années prévues de vie en santé, on pourrait ensuite constater le progrès réalisé vers l'atteinte de cet objectif à partir d'un certain indice d'espérance de vie pondérée de la qualité, du genre possiblement de celui présenté ci-dessus.

En valorisant explicitement les efforts réussis en vue de minimiser l'invalidité fonctionnelle ainsi que la perte de vie, cet indice correspondrait étroitement avec des idées acceptées sur les besoins de santé tout en permettant une évaluation objective du succès ou de l'échec par rapport à ces objectifs. Les buts ultimes de la planification en matière de santé seraient à tout le moins exprimés en termes de résultats plutôt que tout simplement en termes d'intrants intermédiaires ou de dépenses. On aurait établi les bases d'un système de comptabilité sociale – une pré-condition au maintien ou à l'augmentation de l'efficacité et de l'efficience de longue durée des efforts en vue d'améliorer notre santé.

Note

1. Voici les pondérations utilisées : institutionalisation à long terme, 0,4; ne peut s'adonner à une activité principale, 0,5; activité principale restreinte, 0,6; restriction mineure de l'activité, 0,7; invalidité à court terme, 0,5; aucune restriction des activités, 1,0.

Introduction
MEASURING HEALTH STATUS

> As mortality has declined the scope of public and private health services has increased and new objectives have been established. The economic and social consequences of illness now receive more attention than formerly in evaluating levels of health and the importance of health problems. The chronic diseases have become relatively more important. Their consequences include not only death but reduced productivity, prolonged disability, and the need for care.
>
> Sullivan (1966, p. 1)

Need for a More Comprehensive Evaluation of Population Health Status

Are Canadians healthier now than they were fifteen years ago—or less so? Average life expectancy is increasing, that much is clear,[1] but what about the amount of sickness and disability in the population? Surely healthfulness implies not only survival, but also a certain quality of life.

While time series data for Canada are lacking, in the United States data from the annual Health Interview Survey show that reported long-term disability in the non-institutionalized American population increased by 25 per cent from 1966 to 1976.[2] Of course, that was a time of improved sick-leave benefits and more widespread coverage by hospital and medical insurance. It was also a time of deinstitutionalization for the mentally ill, which added to the number of functionally disabled persons in the household population covered by the survey. Nevertheless, the trend is disquieting, and throws into question more optimistic assessments of changes in population health status based soley on improved life expectancy.

But neither life expectancy nor disability statistics, considered one at a time, tell the whole story. After all, in so far as chronic illness is more common at advanced ages, a greater amount of disability is one of the natural, perhaps even inevitable, consequences of longer life. What is needed, then, is a unified view of mortality, institutionalization, and non-institutionalized disability in the Canadian population. Such information from a single point in time would allow us to make direct comparisons among provinces and regions, and to examine the health disparities separating men and women, persons of various ages, community sizes, and social origins. Similar information for another point in time would allow us to determine whether we are collectively making progress, or falling back, in our pursuit of the goal of a long and healthy life.

It is only recently that the necessary information has become available for a comprehensive evaluation of health status in Canada. Unfortunately, knowledge of the health status of Canadians in the 1960s and most of the 1970s was generally limited to what could be gleaned from birth and death records. These could be used to tell us how long we lived, but not how well. Little was known about the quality of health enjoyed by the Canadian population in recent years, except in so far as the consumption of health-care services was involved. Despite massive expenditures on health-care services—currently over 7 per cent of Gross National Product—information on the amount of sickness and disability in the general population has been collected only twice: in 1950-51 for the Canadian Sickness Survey (Dominion Bureau of Statistics, 1960b), then not again until 1978-79 for the Canada Health Survey (1981).[3]

With the release of results from the Canada Health Survey in the summer of 1981, information on health problems and disability in the household population became available for the first time in twenty-seven years, thus filling the previous void in health statistics concerning the status of the vast majority of persons who neither died nor were institutionalized during the year. This meant that all of the pieces needed for a comprehensive evaluation of population health status were finally available—covering mortality, institutionalization and non-institutionalized disability. It only remained to put all of the pieces together in a way that would make sense to health planners, policy analysts and the public as a whole.

Development of a Comprehensive Index of Population Health Status

> The common element in all episodes of disability is the disruption of normal social activity. This characteristic can be abstracted from illnesses as diverse as a common cold, a wartime injury, or a case of schizophrenia.
>
> Sullivan (1971b, p. 2)

Over the years, many general indexes of health have been proposed, although relatively few have actually been applied.[4] McMaster University health economist George Torrance (1976) has shown that most, if not all, of the proposed indexes can be related to a common health index model, and expressed in terms of the same general mathematical formulation. Nevertheless, the various indexes differ substantially in terms of data requirements, weighting schemes, and the clarity of the results that they should ultimately produce.

Conceptually, all of these indexes view health as a continuum extending between death and complete well-being, along which a person's state at any particular moment may be determined. The idea of health as a continuum has now become so entrenched that we may all too easily overlook the obvious fact that the simplification involved in reducing health to a single dimension may or may not be appropriate, depending on the uses for which the index is intended.[5]

In most cases, state of health is determined simply by observing whether a person is or is not able to take part in normal social activities such as working, going to school or keeping house.[6] In other cases, health status is measured in terms of ability to carry out the basic activities of daily living, such as getting up, dressing, eating and using the toilet.[7]

Although all of the indexes view health as a continuum and measure health status in terms of functional ability, they differ greatly when it comes to taking account of death as well as disability. For this purpose, health indexes based on the life expectancy model have the advantage of being able to handle trade-offs between death and disability in a very natural way.[8] Indexes such as these, which produce estimates of life expectancy in each of two or more states of health, are known as health expectancy indexes.[9]

Health Expectancy: A Comprehensive, Understandable and Operational Index of Health

In its simplest form (as described by Sullivan, 1971a), the health expectancy index takes overall life expectancy and breaks it down into years of disability-free life and years of disabled life.[10] Because the results are expressed in simple and unambiguous terms, they can be useful to non-specialist policy makers and planners, as well as to the general public. Moreover, calculation of the health expectancy index is a straightforward affair based on known techniques similar to those used for the construction of ordinary life tables. All of the basic data required can be obtained from a sample survey of disability in the household population, together with estimates of institutional morbidity and data on mortality in the general population. Because of these desirable properties, and because its limitations are well understood (see Sullivan, 1966, 1971b), the health expectancy index has often been suggested as a model for Canadian health planning and policy analysis.

In a 1974 review of population health indexes, Health and Welfare Canada researcher Neil Collishaw (1974, pp. 10-11) recommended "that the proposed Canada Health Survey be used, in conjunction with other data sources, to develop a Canadian Health Index along the lines suggested by Sullivan." It was his opinion that the health expectancy index "probably represents the most objective measurement of general health that could be hoped for in a national household survey."

More recently, a study of health indicators done for the Quebec Ministry of Social Affairs by Alain Colvez (1979) also concluded that Sullivan's approach should be used to calculate life expectancy in each state of health for the Quebec population, as an aid to health planning and evaluation. Using disability rates from the United States National Health Interview Survey, together with Canadian hospitalization data, Colvez showed how health expectancy could be calculated for Quebec, once the results of the Canada Health Survey became available.

There was thus widespread agreement on the need for population-based health indexes, and even a good deal of consensus on the specific form such indexes might take, but the actual application of these principles to the evaluation of Canadian health programs and policies had to await the results of the Canada Health Survey, which did not become available until the summer of 1981.

The chapters to follow proceed step by step through the construction of a health expectancy index for Canada. In the first three chapters, the basic data components required for the calculation of health expectancy—mortality in the total population, long-term institutionalization, and disability in the household population—are examined in turn. Chapter Four shows how the health expectancy index synthesizes the various data components upon which it is based. Chapter Five describes the distribution of health expectancy in Canada, based on our findings. Chapter Six presents projections of disability to the year 2051, and this is followed by a final chapter devoted to our conclusions and recommendations.

Notes

1. According to official life tables published by Statistics Canada, from 1966 to 1976, life expectancy at birth in Canada increased by 2.3 years for females, and 1.4 years for males. Preliminary data for 1978 (reported in Chapter One) show that the trend of increasing life expectancy for both sexes has been maintained or even intensified in the last few years. For a review of Canadian mortality trends from 1926 to 1976, see Wilkins (1980a).

2. See the analysis by Colvez and Blanchet (1981, Table 1). If only severe long-term disability is considered (persons unable to do their major activity—whether work, school or housekeeping), the increase in prevalence from 1966 to 1976 was no less than 67 per cent.

3. Statistics Canada's Labour Force Survey contains a question on disability that was designed to reduce the response burden of persons who are obviously unable to work; it does not seem suitable for, nor was it ever intend as, part of a general index of health. A 1973 World Health Organization study of five western Canadian communities (Josie, 1974) inquired as to the existence of functional disability in the population surveyed, but the results were not necessarily applicable to the rest of Canada, and details as to the severity of disability experienced were not included.

4. For a thorough review of the extensive literature on the development of health status indicators, see Goldberg et al. (1979).

5. According to Sullivan (1966, p. 6), "The model of health as a [unidimensional] continuum extending from death to some optimum state of well-being was apparently first used by Reed [1949]. He carefully identified it as a heuristic device which greatly oversimplified a situation characterized by many possible axes of measurement."

6. In most health surveys, this behavioural evidence of functional ability, as it is called, may be either self-reported or observed by a competent member of the same household.

7. Recent international efforts aimed at the development of better measures of functional disability, based on the activities of daily living (ADL) approach, are summarized in a manuscript by McWhinnie (1979).

8. Because these health expectancy indexes are based on the same life tables used to calculate "ordinary" life expectancy, they automatically accord greater importance to deaths at earlier ages, thus avoiding the arbitrary weighting schemes to which other types of models must have recourse when attempting to evaluate the joint effect of death and disability.

9. Conceptually similar indexes of this type have been proposed by Sanders (1964), Sullivan (1971a), Chen et al. (1975), and Berg (1973). Of these, Sullivan's version is the best known and most completely documented, in addition to having been used several times to calculate disability-free life expectancy in the United States population.

10. To do this, Sullivan first determined the total volume of disability–including both institutionalized and non-institutionalized forms. He then calculated the set of age-specific rates of disability, and applied these to the hypothetical life table populations that were used to calculate overall life expectancy. In the chapters ahead, we follow this same approach, except that we further subdivide disabled life according to the severity of disability experienced.

Chapter One

MORTALITY IN THE TOTAL POPULATION

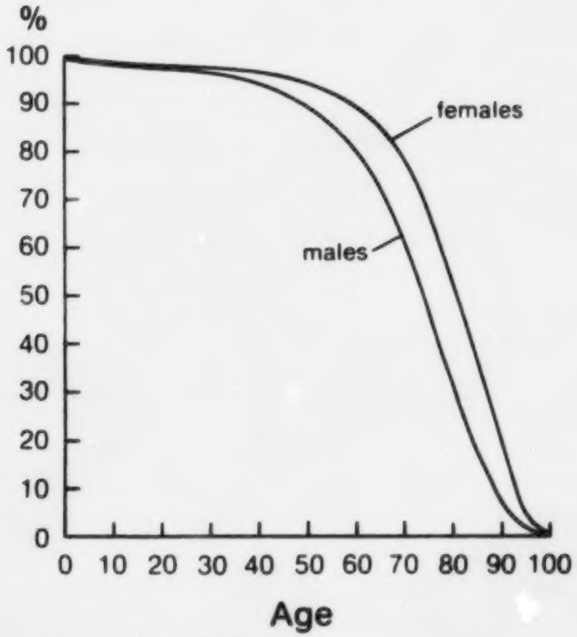
Life expectancy is a summary of the mortality experience of a population over each stage of the life cycle. It is a measure of the overall length of life that makes no distinction among various states of health impairment short of death. Chapter One describes the distribution of life expectancy in Canada by age, sex, region, community size and income.

Life expectancy at birth is the average number of years a newborn child would live if a given set of age-specific mortality rates were to continue unchanged into the future. As the maximum length of life is more or less fixed (at somewhere around one hundred years in most cases), average length of life depends not so much on the superior longevity of a few extraordinary individuals as it does on the avoidance of premature mortality by the majority. In like fashion, the health expectancy of a population depends not only on the state of health of persons still alive at a given age, but also on the percentage of persons surviving to that age.

The calculation of life expectancy involves the construction of life tables. The latest official life tables for Canada relate to the three-year period centred on the census of 1976. Since our basic data on the health status of the living (disability in the household population, as shown in the Canada Health Survey) were collected during 1978 and part of 1979, a new set of life tables was constructed for the three-year period centred on 1978.[1] It is these updated life tables that will serve in Chapters Four and Five as the basis for our analysis of health

Figure 1.1

Survivors by Age and Sex, Canada, 1978



Source: See Table 1.1.

TABLE 1.1

Survivors and remaining life expectancy, by age and sex, Canada, 1978[a] (percentage surviving and years remaining)

Age	Survivors[b]			Life Expectancy[c]		
	M	F	T	M	F	T
0	100.0	100.0	100.0	70.8	78.3	74.6
1	98.7	99.0	98.8	70.7	78.2	74.4
5	98.4	98.7	98.6	66.9	74.3	70.6
10	98.2	98.6	98.4	62.1	69.4	65.8
15	98.0	98.5	98.2	57.2	64.5	60.9
20	97.3	98.2	97.8	52.6	59.7	56.1
25	96.4	98.0	97.2	48.1	54.8	51.5
30	95.7	97.7	96.7	43.4	50.0	46.7
35	95.0	97.3	96.2	38.7	45.1	42.0
40	94.0	96.8	95.4	34.1	40.4	37.3
45	93.0	96.0	94.2	29.6	35.7	32.7
50	90.1	94.6	92.4	25.3	31.2	28.3
55	86.2	92.5	89.4	21.3	26.8	24.2
60	80.5	89.5	85.0	17.6	22.6	20.3
65	72.3	85.1	78.7	14.4	18.7	16.7
70	61.4	78.6	70.0	11.4	15.0	13.4
75	47.9	69.2	58.5	8.9	11.7	10.6
80	33.0	56.2	44.6	6.9	8.8	8.1
85	18.6	39.0	28.8	5.3	6.6	6.1
90	7.9	21.1	14.5	4.3	5.1	4.9

Source: From abridged life tables constructed by the authors.

Notes:

a. Based on death data for 1977, 1978 and 1979, and post-censal estimates of population for 1978.

b. Percentage of initial life table population surviving at each age.

c. Years of remaining life expectancy at each age.

expectancy in each state of health.

Survivors and Life Expectancy by Age and Sex

Figure 1.1 and Table 1.1 show the percentage of males and females expected still to be surviving at various ages, based on the mortality experience of the Canadian population during the years 1977, 1978 and 1979. At any given age, the percentage of females surviving is higher than the percentage of males surviving due to the effects of differential mortality in favour of females. Moreover, because these effects are cumulative over the life cycle, the gap between the percentage of males and females surviving increases markedly with advancing age.

At age 65, 85 per cent of females, but only 72 per cent of males (in the hypothetical life table population), are still alive. Moreover, the difference in life expectancy at age 65 between surviving males and females is 4.3 years. By the time all have died, the lower mortality rates of females result in an advantage of 7.5 years of life expectancy at birth in favour of females.

Life Expectancy by Region

Examination of our results for 1978 compared to the official life tables for 1976 and 1971 reveals a continuation—even an intensification—of the recent trend in the direction of significantly improved life expectancy generally for both sexes, all regions, and most age groups.[2] This is most encouraging, as continued gains in life expectancy are generally considered to become progressively more difficult to obtain as average length of life increases. Nevertheless, in international perspective, Canadian life expectancy is still at least two years short of that of Sweden or Japan, the world leaders.

Table 1.2 shows Canadian trends in life expectancy by region from 1951 to 1978. In terms of regional disparities in life expectancy, the difference between regions of highest life expectancy (Prairies and British Columbia) and lowest life expectancy (Quebec) fell from roughly four years in 1951 to less than two years for each sex in 1976. Further reductions in regional disparities for females occurred between 1976 and 1978 (from 1.9 to 1.3 years).

TABLE 1.2

Life expectancy at birth, by sex, by region, Canada, 1951-1978

Sex/Year[a]	Canada[b]	Atlantic[c]	Quebec	Ontario	Prairies[c]	B.C.
Males						
1951	66.3	66.6	64.4	66.9	68.4	66.7
1956	67.6	67.9	66.1	67.8	69.3	68.1
1961	68.4	68.6	67.3	68.3	69.8	68.9
1966	68.8	68.5	67.9	68.7	70.2	69.2
1971	69.3	69.0	68.2	69.6	70.5	69.9
1976	70.2	69.7	69.1	70.6	71.0	71.0
1978	70.8	70.5	69.7	71.2	71.5	71.6
Females						
1951	70.8	70.5	68.6	71.9	72.3	72.4
1956	72.9	72.9	71.0	73.6	74.2	73.9
1961	74.2	73.9	72.8	74.4	75.7	75.4
1966	75.2	74.9	73.9	75.5	76.3	75.8
1971	76.4	76.1	75.3	76.8	77.2	76.7
1976	77.5	77.1	76.5	77.7	78.1	78.4
1978	78.3	78.3	77.6	78.4	78.9	78.9

Source: From official Canadian life tables, as shown in Statistics Canada, catalogue 84-206 (1978), Table 3, for 1931-1971, and Statistics Canada, catalogue 84-532 (1979), for 1976. For 1978, abridged life tables were calculated by the authors from vital statistics data and population estimates, using the methods described by Silins and Zayachkowski (1966), and programs of D. Nagnur of the Health Division, Statistics Canada.

Notes:
a. Three-year averages centred on years shown.
b. Including Yukon and Northwest Territories.
c. For 1961 to 1976, based on population-weighted averages of relevant provincial life expectancies.

Life Expectancy by Community Size

The Canada Health Survey sample was structured so as to permit disaggregation by community size.[3] In order to be able to use the survey data on disability by community size for the calculation of expected time spent in each state of health, we also required a set of life tables by community size. As the last such tables for Canada cover the years from 1970 to 1972 (Basavarajappa and Lindsay, 1976), we produced another set of life tables by community size for the three-year period centred on 1976—the most recent year for which age-sex distributions of the population by municipality were available.

Table 1.3 shows 1976 life expectancy at various ages according to community-size groups. In general, life expectancy in Canada's three largest cities is considerably higher than the Canadian average, while life expectancy in rural areas is considerably below the average. Among urban community-size groups of less than one million population (in other words, in all cities and towns with the exception of Montreal, Toronto and Vancouver), differences in life expectancy are not very appreciable. These figures serve as the basis for our calculations of health expectancy (life expectancy in each state of health) by community size, which will be presented in Chapter Five.

Life Expectancy by Income

Socio-economic disparities in life expectancy are among the most concrete expressions in inequality of condition among the various classes of Canadian society.

In an analysis of 1971 mortality by census tract in urban Canada, two researchers from the Department of National Health and Welfare (Wigle and Mao, 1980) demonstrated that a strong relationship exists between life expectancy and median household income. According to their results, shown in Table 1.4, life expectancy for males of the highest income level is approximately six years greater than that for males of the lowest income level. For females, the difference in life expectancy is about three years. Because grouped rather than individual data were used, and because of the way income levels were determined, these figures should be considered to be minimum estimates of mortality and life expectancy differences by income.[4]

TABLE 1.3

Life expectancy at birth and at age 65, by sex, by community size, Canada, 1976[a] (in years)

Community Size	At Birth			Age 65		
	M	F	T	M	F	T
1 000 000 and over	71.8	78.8	75.3	14.3	18.8	16.7
100 000 - 999 999	70.1	77.7	73.9	13.6	18.2	16.1
10 000 - 99 999	69.8	77.8	73.8	13.9	18.4	16.3
1 000 - 9 999	69.9	78.1	74.0	14.3	18.7	16.7
Less than 1 000 and rural	69.1	76.0	72.5	14.[illegible]	17.1	15.7
Total	70.2	77.5	73.8	14.0	18.0	16.1

Source: From abridged life tables calculated by the authors from vital statistics and census data. See Basavarajappa and Lindsay (1976) for a discussion of mortality differences by community size in Canada.

Note: a. Based on deaths from 1975 to 1977, births from 1974 to 1977, and 1976 census populations.

TABLE 1.4

Life expectancy at birth and at age 65, by sex, by income level, metropolitan areas of Canada, 1971[a] (in years)

	At Birth		Age 65	
Income Level[b]	M	F	M	F
Lowest	66.3	74.6	12.3	16.5
Second	69.2	75.6	13.3	16.6
Third	70.1	76.6	13.4	16.7
Fourth	71.1	77.0	13.6	17.0
Highest	72.5	77.5	14.1	17.0
Total	70.0	76.4	13.3	16.7

Source: Wigle and Mao (1980), Table 6.3.1.

Notes:

a. Based on 1971 population and deaths in the 21 Census Metropolitan Areas.

b. Based on 1970 median household income of census tract; levels shown divide the urban population approximately into fifths; national cut-offs used for determining income level, regardless of local income distribution.

Nevertheless, as this study is the most comprehensive analysis of socio-economic differences in mortality presently available for Canada, we will use its findings as the basis for our estimates of disparities in health expectancy by income. (See Chapter Five for these results.)

This chapter has discussed the relationship between survival and average length of life, traced the trend of life expectancy from 1951 to 1978, and briefly described the distribution of life expectancy for Canada by age, sex, region, community size and income. While our findings show much about the overall length of life in Canada, they tell us nothing of the quality of health experienced during those years of life.

In order to evaluate healthfulness comprehensively, not only mortality, but also morbidity must be taken into consideration. Accordingly, the next two chapters look first at long-term institutionalization, and then at disability in the household population. Chapter Two examines that part of serious morbidity which results in long-term institutionalization—whether in hospitals, mental hospitals or other long-term care facilities such as nursing homes for the elderly.

Notes

1. Abridged life tables for the period 1977-1979 were constructed using the methods and programs employed by D. Nagnur of the Vital Statistics Section, Health Division, Statistics Canada. For a description of the method, see Silins and Zayachkowski (1966). As the 1978 tables were based on post-censal estimates of population, rather than actual census counts, caution needs to be exercised in their interpretation.

2. Had we not produced new life tables for 1978, use of the last official triennial life tables (for 1976) would have resulted in an across-the-board underestimation of life years lived and of survivors at each age.

3. In the Canada Health Survey, community-size group was determined in the same manner as in the Labour Force Survey and

in the 1976 census, except that the Canada Health Survey included a supplementary size group for cities with over one million population (Toronto, Montreal and Vancouver). Note that each locality is classified according to the size of the entire urban community of which it is a part, rather than according to its own size individually. For example, the Montreal suburb of Pointe Claire, Quebec (population 25 000 in 1976) is classified in the largest community-size group (over one million) because that is the size of the entire Montreal metropolitan area.

4. In Wigle and Mao's (1980) study of mortality by income in Canada's metropolitan areas, income level was determined by the median household income of the census tract, with no adjustment for family size, metropolitan area population, or regional differences. In practice, this meant that nearly half of the population of the Saint John, New Brunswick and St-John's, Newfoundland metropolitan areas was placed in the lowest income level, while about 40 per cent of Toronto-area residents were classified in the highest level. This had the effect of reducing the visibility of disparities based on relative differences in income that might otherwise have been apparent, had local differences been taken into account. Nevertheless, the differences in mortality between income groups as shown in Wigle and Mao's figures are still quite substantial.

Chapter Two
LONG-TERM INSTITUTIONALIZATION

This chapter examines long-term institutionalization in the total population. Residents of institutions such as nursing homes, chronic-care hospitals and mental hospitals are specifically excluded from household health surveys,[1] and so form a separate component of the total volume of disability in Canada. The first part of this chapter documents the data sources and estimation procedures used for determining the volume and age-sex distribution of long-term institutionalization. The second part of this chapter presents and discusses the rates of institutionalization by age and sex, as well as by region and type of institution.

Data Sources and Estimation Procedures

Long-term institutionalization for purposes of health care is, almost by definition, a form of disability, in that normal economic, social and recreational activities are thereby severely limited or completely impossible. However, not all institutionalization is for purposes of health care, nor is it necessarily long term. For example, persons temporarily in hospital are already included in the Canada Health Survey counts of disability in the household population, while residents of homes for the aged who are only receiving room and board (as opposed to nursing or other professional care) are not necessarily limited in the activities normal for their age.

Long-term institutionalization for purposes of health care occurs in three types of facilities: hospitals, mental hospitals and special-care

TABLE 2.0

Long-term institutionalization for purposes of health care: summary definitions and number of residents in each category, Canada, 1978.

In the definitions to follow, the various categories of institutions will be abbreviated as here indicated:

GSH	General and allied special hospitals
SSH	Short-stay units of general and allied special hospitals
LSH	Long-stay units of general and allied special hospitals
MHO	Mental hospitals[a]
PPH	Public psychiatric hospitals (predominantly short-stay)
MHL	Mental hospitals less public psychiatric hospitals
SCF	Special-care facilities[b]
SCFA	Self-sufficient residents of special-care facilities[b, c]
SCFN	Non-self-sufficient residents of special-care facilities[b, d]

The component categories of institutionalized disabilities in long-term health-care facilities are then defined as follows (average 1978 population indicated within parentheses):

LSH (47 000) = GSH (134 000) - SSH (87 000)
MHL (11 000) = MHO (12 000) - PPH (3 000)
SCFN (156 000) = SCF (180 000) - SCFA (24 000)

Summing the three component categories yields total institutionalized disability in long-term health-care facilities (INST), as shown:

INST (214 000) = LTU (47 000) + MHL (11 000) + SCFN (156 000)

Source: See detailed description in Chapter Two.

Notes:
a. Excluding psychiatric units of general and allied special hospitals.
b. Including estimates for facilities known to be operating but not reporting.
c. Except residents attending special school or sheltered workshop.
d. Plus residents attending special school or sheltered workshop.

facilities. For purposes of estimating the volume and age-sex distribution of institutionalized disability in the total population, the available data on each category of facilities present certain problems. These are described in the sections to follow, along with the methods employed in attempting to overcome them.

For hospitals and mental hospitals, different sources were used for the volume of long-term institutionalization (from annual returns) on the one hand, and for the age-sex distribution of patients (from admission/separation forms) on the other hand.[2] This was necessary because the annual returns produce an accurate count of the volume of patients under care during the year, but without any distribution by age and sex. On the other hand, the admission/separation data, which were used to estimate the age-sex distribution, do not as accurately reflect the total volume of patient-days of care during the year as do the data from the annual returns.

For special-care facilities, a single source (the Annual Return of Special Care Facilities) supplied both the volume of patients under care and their age-sex distribution. Readers not interested in the detailed sources and procedures used to produce our estimates of long-term institutionalization may now wish to skip ahead to the text relating to our results. These begin with the section entitled "Institutionalization by Age and Sex."

Long-Stay Units of General and Allied Special Hospitals

For general and allied special hospitals, the annual returns show the breakdown of days of stay by whether these occurred in long-stay or short-stay units. Since persons in short-stay units are included in the household population covered by the Canada Health Survey, only days of stay in long-stay units were retained, in order to avoid double-countin of the institutionalized population. Patient-days in long-stay units are mainly in extended care (including chronic) and rehabilitation (including convalescent) hospitals, and also in specialized long-term care units of other hospitals.[3] The overall volume of care in long-stay units of general and allied special hospitals was taken from the number of patient-days during the fiscal year in such units, as shown in the Annual Return of Health Care Facilities—Hospitals, Part One, and published in

Statistics Canada, Hospital Annual Statistics.

After the number of patient-days during the fiscal year in long-stay hospital units was obtained, as described above, these days were then distributed by age and sex according to the distribution of days of stay from date of admission for patients separated during the calendar year from extended care (including chronic) and rehabilitation (including convalescent) hospitals. These two categories of hospitals accounted for approximately 70 per cent of total days of stay in all long-stay units of general and allied special hospitals. Patient-days in long-stay units of general hospitals could not be included because Statistics Canada's hospital morbidity files do not distinguish between short-term and long-term units of the same hospital. The required separation data were obtained in the form of special tabulations from the Institutional Care Section, Health Division, Statistics Canada. Related data are published in Statistics Canada, Hospital Morbidity and Statistics Canada, Hospital Morbidity, Canadian Diagnostic List.

Cross-Check of Hospital Data for Quebec

The number of residents in chronic-care hospitals (and other long-stay units) in Quebec was published by the Bureau de la Statistique du Québec (1980, table 11, p. 27). For October 1978 (the mid-point of the 1978-79 fiscal year), the number of residents was shown as 19 558. By comparison, data on long-stay units from the annual returns (Statistics Canada, 1981a) imply an average patient population of 23 533 (days of care divided by 365) in long-stay units of all hospitals. When only public hospitals are included (thus excluding proprietary and federal hospitals), the average patient population was 20 262. The provincial and federal sources are thus in very substantial agreement.

In addition, the Quebec data cited above show an age breakdown of long-stay hospital patients (0-64, and 65-85 and over by five-year age groups), though without a breakdown by sex. This was used to check the age-sex breakdown derived from separation days; once again, the two sources agreed substantially.

Trends in Long-Term Hospitalization

Since 1969, the Health Division of Statistics Canada has published the breakdown of days in general and allied special hospitals by whether these occurred in short-stay or long-stay units (see catalogues 83-210 for 1969-1972; 83-227 for 1973-1975; 83-232 for 1976-1978-79). According to these figures, the annual number of days of care in long-stay hospital units more than doubled over the decade (from 8.0 to 17.4 million days), even as the number of days of care in short-stay hospital units was declining (from 34.0 to 31.6 million days).

These divergent trends can be explained in large part by the fact that the average length of stay of patients admitted to short-stay units fell sharply during this period in response to administrative and budgetary pressures, while the average length of stay of patients in long-stay units remained fairly stable. (Even the constancy of the latter figure may conceal important changes in the type of care dispensed, in so far as many less seriously ill long-term patients are known to have been transferred to nursing homes or deinstitutionalized during the decade.)

Mental Hospitals Except Public Psychiatric Hospitals

The overall volume of care in mental hospitals (except public psychiatric hospitals, which are mostly for short-stay patients) was derived from the number of patient-days during the fiscal year, as shown in the Annual Return of Mental Institutions--General, and published in Statistics Canada, Mental Health Statistics, Vol. III.[4]

The total number of patient-days during the year in each province was obtained as described above. These days were then distributed by age and sex according to the distribution of days of stay from date of admission as shown on the records of patients separated during the year from all mental hospitals except public psychiatric hospitals. (Public psychiatric hospitals were excluded because most patients in these institutions are admitted for relatively short stays only.) The required separation data were obtained in the form of special tabulations from the Institutional Care Section of the Health Division, Statistics Canada. Related data are published in Statistics Canada, Mental Health Statistics, Vol. I, Institutional Admissions and Separations.

Operating Special-Care Facilities, Excluding Residents Receiving Room and Board Only

Estimates of the number of residents in operating special-care facilities, excluding residents receiving room and board only, were derived from data on reporting facilities supplied by the Institutional Statistics Section of the Health Division, Statistics Canada, based on the Annual Return of Special Care Facilities. Unadjusted counts of residents in reporting facilities are shown in Selected Tables from Annual Return of Special Care Facilities (Statistics Canada, 1980d), as are the total number of beds in each category of all operating institutions. For the breakdown of residents by level of care received, special tabulations were obtained from the Institutional Statistics Section.

Adjusted estimates of the number of long-term residents in operating special-care facilities for purposes of health care were determined as follows: first, the total number of residents in operating special-care facilities was estimated from the ratio of beds in operating compared to reporting special-care facilities. Then all residents in three categories of facilities (treatment centres for alcoholics and drug addicts, shelters for transients, and homes for unmarried mothers), which are mainly for short-term stay, were excluded, as were all residents classified as receiving level of care SSF1 or SSF2 (room and board only, or room and board plus parental-type guidance).

Note that residents classified as receiving level of care SSF3 (room and board plus sheltered workshop or special school) were retained, as this category was considered to be conceptually similar to the Canada Health Survey long-term disability category "restricted in the kind or amount of major activity" (RMAJ).

For hospitals and mental hospitals, volume of care was determined by the total number of days of care provided. For special-care facilities, however, a breakdown of the days of care by type of facility was not available for Quebec. Instead of days of stay (divided by 365), then, the average resident population was taken to be the number of residents on the books at the end of the fiscal year. Seasonality did not seem to be much of a factor here. For all types of facilities and all provinces and territories taken together, the two methods yielded almost identical counts of the average number of residents in reporting facilities: 126 951, for the latter, compared to 127 165 for the former.

The estimated number of residents in operating special-care facilities, excluding residents receiving room and board only, and excluding residents of short-term care facilities, was distributed by age, sex and province based on the age-sex distribution of residents of reporting special-care facilities, as shown on the Annual Return of Special Care Facilities. In the case of special-care facilities, the age-sex distribution of residents is indicated by the same form that also shows the total number of residents. As mentioned elsewhere, the ratio of institutions reporting compared to those known to be operating was only about 70 per cent, so estimated data were included for the other 30 per cent when determining the volume of care provided. It was assumed that the provincial age-sex distribution of residents of each category of reporting facility applied equally to the 30 per cent of residents in non-reporting facilities.

Note that the age of elderly special-care facilities residents is shown on the returns by five-year age groups, except in the case of Quebec, where ten-year age groups are shown instead. In order to produce Canada-wide estimates with as much detail as possible in the older age groups, the number of residents by five-year age groups was estimated for Quebec by type of facility, based on the age distribution of such residents in the rest of Canada.

Cross-Check of Special-Care Facilities Data for Quebec and Ontario

The number of residents in les centres d'accueil (special-care facilities) in Quebec was published by the Bureau de la Statistique du Québec (1980, table 11, p. 27). For March 1978 the number of residents was shown as 30 114. By comparison, our estimates for 31 March 1978, based on the Statistics Canada survey of special-care facilities, showed 29 965 residents (all levels of care, all categories of institutions). In addition to this very close agreement as to the total number of residents, the age breakdown from these sources also agreed closely.

Ontario Ministry of Revenue Statistics on Homes for the Aged and Nursing Homes showed 54 651 residents aged 65 and over as of 30 June

1981.[5] By comparison, our estimate for all Ontario special-care facilities residents aged 65 and over on 31 March 1978 was 52 254 (all levels of care, all types of institutions). The two sources, though completely different in origin, are thus in very substantial agreement.

Institutionalization by Age and Sex

Figure 2.1 shows the percentage of the Canadian population of each age group that is resident in long-term health-care institutions of one sort or another. Exclusive of persons receiving room and board only, the average rate of long-term institutionalization for purposes of health care in Canada is nine per thousand population. Up to age 45, the rate is less than three per thousand. At ages 45-64, the rate rises to about five per thousand. At ages 65 and over, the rate of institutionalization at least doubles in each successive five-year age group, until at ages 85 and over, nearly one third of the surviving population is institutionalized.

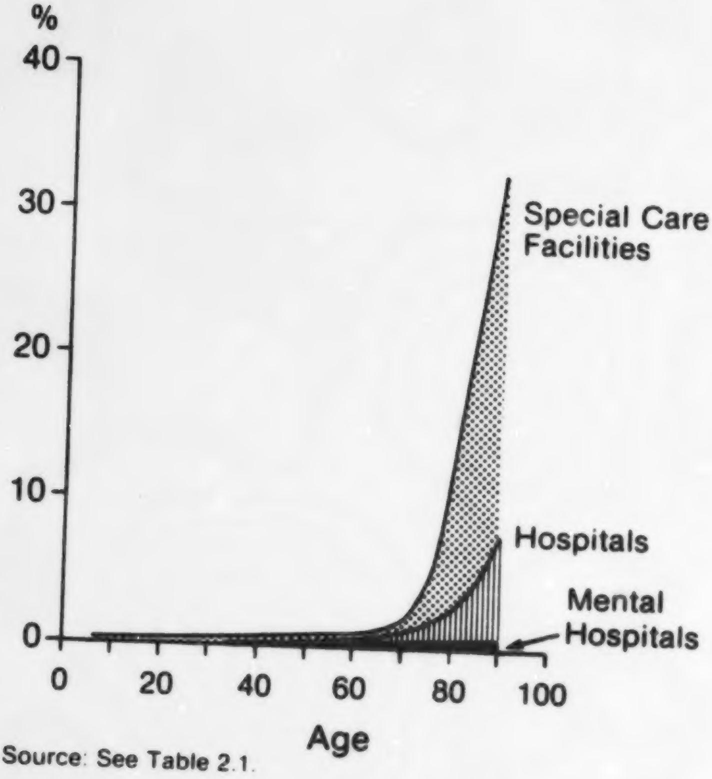
Table 2.1 shows rates of institutionalization by sex as well as by age and type of facility. Up to age 65, men are somewhat more likely than women to reside in long-term health-care facilities. At ages 65 and over, however, the situation reverses. In each successive five-year age group from ages 65 and beyond, women are increasingly more likely to be institutionalized than are men, until by ages 85 and over, 36 per cent of women are institutionalized, compared to 25 per cent of men.

Part of this difference can be explained by the fact that elderly men are more likely than elderly women to have a surviving spouse capable of providing them with basic care. Should their health become impaired, it is thus easier for men than women to continue living at home. Another part of the explanation of the lower rates of institutionalization for elderly men may be related to their higher mortality rates. Death undoubtedly eliminates many men who, were they to survive, might well be impaired and perhaps institutionalized.

By simultaneously taking into account both death and disability (whether institutionalization is involved or not), the health expectancy indexes to be presented in Chapters Four and Five illustrate the kind of trade-offs that can occur between length and healthfulness of life.

Figure 2.1

Long-Term Institutionalization, Canada, 1978



Source: See Table 2.1.

TABLE 2.1

Long-term institutionalization, by type of facility, by age and sex, Canada, 1978[a]
(rate per thousand population)

Age	Hospitals[b]			Mental Hospitals[c]			Special-Care Facilities[d]			Total		
	M	F	T	M	F	T	M	F	T	M	F	T
0-14	0.2	0.2	0.2	0.1	0.1	0.1	1.7	1.1	1.4	2.0	1.4	1.7
15-24	0.3	0.2	0.2	0.4	0.2	0.3	2.3	1.6	1.9	2.9	1.9	2.4
25-44	0.4	0.4	0.4	0.5	0.3	0.4	1.9	1.4	1.6	2.7	2.0	2.4
45-64	1.8	1.7	1.7	0.8	0.5	0.7	3.3	3.1	3.2	5.9	5.2	5.6
65-69	4.9	4.8	4.9	1.2	0.9	1.0	10.6	11.3	11.0	16.8	16.9	16.9
70-74	8.7	10.5	9.7	2.1	1.0	1.5	19.9	25.5	23.0	30.7	37.0	34.2
75-79	14.3	19.6	17.4	2.7	1.4	2.0	41.3	56.7	50.2	58.3	77.7	69.6
80-84	24.0	41.3	34.8	2.0	2.7	2.4	96.5	148.0	128.6	122.5	192.1	165.9
85+	49.2	64.4	59.1	3.0	4.1	3.7	188.2	278.3	246.8	240.5	346.7	309.6
All Ages	1.5	2.4	2.0	0.5	0.4	0.5	5.1	8.2	6.7	7.2	11.0	9.1
N	18 000	29 000	47 000	6 000	5 000	11 000	59 000	97 000	156 000	84 000	130 000	214 000

TABLE 2.1 (continued)

Source: Average number of total residents under care derived from Statistics Canada, catalogue 83-232 (1981a), Table 3; Ibid., catalogue 83-205 (1981d), Table 8; Ibid., uncatalogued (1980d), Tables 1A, 6, 89. The latter two sources also show age and sex breakdown for special-care facilities residents. Age and sex breakdown for mental hospital residents derived from the distribution of days of stay since admission for patients separated during the calendar year 1978, as obtained in special tabulations from the Mental Health Section, Health Division, Statistics Canada, July 1981. Age and sex breakdown for long-stay residents derived from the distribution of days of stay since admission for extended care and rehabilitation hospital patients separated during the calendar year 1978, as obtained in special tabulations of data from the Hospital Morbidity Section, Health Division, Statistics Canada, January 1982. Population estimates from Statistics Canada, catalogue 91-202 (1980a).

Notes:

a. Based on patient days of care during the fiscal year beginning 1 April 1978, except in the case of special-care facilities, for which the figures are based on the number of residents on the books as of 31 March 1978.

b. Long-stay units of general and allied special hospitals.

c. Except short-stay public psychiatric hospitals.

d. Excluding self-sufficient residents and short-stay facilities (residents of any facility receiving level of care SSF1 or SSF2, as well as all residents of treatment centres for alcoholics and drug addicts, homes for unmarried mothers, and reception centres for transients).

TABLE 2.2

Long-term institutionalization, by type of facility, by region, Canada, 1978[a]
(percentage of total in region, and rate per 1 000 population)

Region	Hospitals[b] %	Mental Hospitals[c] %	Special-Care Facilities[d] %	Total %	N	Adjusted Rate[e] %
Atlantic	4.0	10.1	86.0	100.0	18 000	8.1
Quebec	48.0	1.1	50.9	100.0	49 000	9.0
Ontario	13.0	5.3	81.7	100.0	82 000	9.4
Prairies	14.2	5.5	80.3	100.0	41 000	9.8
British Columbia	25.0	8.0	67.0	100.0	24 000	8.4
Canada(f)	21.8	5.1	73.1	100.0	214 000	9.1

Source: Hospital data from Statistics Canada (1981a), Table 3. Mental hospital data from Statistics Canada (1981d), Table 8. Special-care facilities data estimated on the basis of Statistics Canada (1980d), Tables 1A, 6, 89, and special tabulation supplied by the Institutional Statistics Section, Health Division, Statistics Canada, 14 August 1981. See text for details of estimation procedures.

Population estimates from Statistics Canada (1980a).

TABLE 2.2 (continued)

Notes:

a. Based on patient days of care during the fiscal year beginning 1 April 1978, except in the case of special-care facilities, for which the figures are based on the number of residents on the books as of 31 March 1978.

b. Long-stay units of general and allied special hospitals.

c. Except short-stay public psychiatric hospitals.

d. Excluding self-sufficient residents and short-stay facilities (residents of any facility receiving level of care SSF1 or SSF2, as well as all residents of treatment centres for alcoholics and drug addicts, homes for unmarried mothers, and reception centres for transients).

e. Rate per 1 000 population, adjusted to the age and sex structure of the Canada population; based on final postcensal estimates of population for 1 June 1978. Unadjusted rates were 8.2, 7.8, 9.7, 10.3 and 9.4, respectively, for each region from east to west.

f. Including Yukon and Northwest Territories.

Institutionalization by Region and Type of Facility

Table 2.2 shows, for each region of Canada, the overall rate of institutionalization in long-term health-care facilities, as well as the percentage distribution of the institutionalized population among the various categories of facilities.

Rates of long-term institutionalization for purposes of health care vary little from region to region in Canada. Unadjusted rates for all categories of institutions taken together range from a low of about eight per thousand population in the Atlantic region and Quebec, to a high of about ten per thousand in the Prairies. Since differences in these rates are closely related to average life expectancy, age adjustment brings the rates for Quebec and the Prairies even closer to the national average of nine per thousand population.

The distribution of the institutionalized population among the various categories of long-term health-care facilities varies widely among the regions. For Canada as a whole, 73 per cent of long-term institutionalization occurs in special-care facilities, but the range is from 51 per cent in Quebec to 86 per cent in the Atlantic region. Long-stay hospital units account for only 4 per cent of institutionalization in the Atlantic region, but no less than 48 per cent in Quebec. On the other hand, residents of mental hospitals, which include but 1 per cent of the institutionalized population in Quebec, form 10 per cent of the total in the Atlantic region. Ontario and the Prairies have very similar distributions of their institutionalized populations—distributions that are fairly close to the average for Canada.

Because the overall rates of institutionalization are so similar across Canada, the total volume of long-term institutionalization for purposes of health care may reflect an underlying similarity in the need for such care in the populations of the various regions. The lack of regional similarity in the distribution of the institutionalized population among the various categories of facilities, however, points up the extent to which placement of a patient in one category of facility or another depends on factors other than the patient's state of health.

This dissimilarity among regions underscores the danger of trying to make inferences about population health status based on institutional data—or worse yet, based on institutional data for only one or two categories of facilities. Patterns of institutionalization by type of facility appear to reflect regional traditions and provincial health policies much more than they do any imperatives in underlying needs or requirements for care.

Notes

1. The Canada Health Survey, "Manual for Interviewers" (1978) is quite specific on this point: "Exclude the following persons as household members: persons who were formerly members of the household but who at the time of the interview...are inmates of correctional or penal institutions, mental institutions, homes for the aged or needy, rest homes or convalescent homes, homes or hospitals for the chronically ill or handicapped, regardless of how long they are expected to remain there."

2. Note that the period of time covered by the two sources is slightly different: the fiscal year in the case of the annual returns, and the calendar year in the case of admission/separation forms. The coverage of the two sources also differs slightly: 100 per cent in the case of the annual returns, compared to about 95 per cent in the case of the admission/separation forms.

3. The operational definition of long-stay units used here refers to the categorization of units as reported on the Annual Return of Health Care Facilities--Hospitals, Part One. It is recognized that this definition excludes several categories of patients whose presence in hospital presumably would not have been known to the Canada Health Survey. In the first place, residents of single-person households temporarily absent due to hospitalization would not have been home to respond to the Canada Health Survey (nor would proxy responses have been taken), even though, in principle, they were included in the survey universe. In the second place, a small portion of total beds in units classified as short-stay are actually occupied by long-term residents. In some cases, stays of particularly long duration are not fully reflected in the

admission/separation statistics due to the practice of phantom "discharge and readmission" for administrative and budgetary reasons having nothing at all to do with the patient's requirements for care.

4. Patient-days in psychiatric units of general and allied special hospitals are reported on the Annual Return of Health Care Facilities--Hospitals, Part One, but these units are predominantly for short-term care, in any case.

5. Personal communication, Arlene Hoffman, Ontario Ministry of Health, 27 August 1981.

Chapter Three
ACTIVITY RESTRICTION IN THE HOUSEHOLD POPULATION

> The vast bulk of care received by the chronically impaired is provided informally, principally by family members.
>
> Dunlop (1980, p. 515)

Limitation in normal activities, whether temporary or permanent, is a measure of the serious consequences of health problems. In terms of health status, the effect of impaired health on a person's ability to function is what really matters—not whether the problem was treated by a health professional or resulted in institutionalization.

The Canada Health Survey asked three series of questions related to health impairment: one series focused on short-term disability, another concerned long-term activity limitation, and the third had to do with self-defined health problems. The first two approaches are considered most relevant to our purposes, as they were specifically concerned with the behavioural consequences of health impairments, rather than their mere presence without regard to effect.

The average annual number of short-term disability days per person in the household population was sixteen for any level of disability, and five for bed disability. In addition, approximately 12 per cent of the household population reported some degree of long-term activity limitation. In order to avoid double counting, we obtained a special tabulation of short-term disability days for persons not reporting any long-term activity limitation.

In this fashion, disability in the household population is seen as being composed, on the one hand, of persons with long-term activity limitation (about 12 per cent of the population, who were limited in their activities for 90 per cent of the year on the average[1]), and, on the other hand, of persons who did not report any chronic activity limitation, but were, none the less, subject to periods of relatively acute short-term disability.

Short-Term Disability

Data on short-term disability in the household population were obtained from answers to Section I of the Interviewer Administered Questionnaire (IAQ) of the Canada Health Survey. The average annual number of disability days was calculated by multiplying by 26 the number of disability days in the two weeks preceding the survey.[2] This method can only be used to compute group averages and is inapplicable to individuals.

In the calculation of rates of short-term disability in the household population, care must be taken to avoid double counting of persons reporting both long- and short-term disability.[3] After eliminating days of short-term disability due to persons with long-term activity limitation, what remains is the amount of short-term disability among persons not reporting any long-term limitation (which we will abbreviate OSTD, for "only short-term disability").

As will be noted later in this chapter, rates of long-term activity limitation increase with advancing age for both sexes. Days of short-term disability per person in the entire population also increase rapidly with advancing age. Significantly, however, days of short-term disability per person for those without long-term activity limitation do not increase with advancing age. For persons reporting no long-term activity limitation, the amount of short-term disability is fairly constant regardless of age, with males reporting an average of six or seven, and females an average of about ten days per person per year. This indicates that essentially all of the increase in short-term disability rates, which is seen with advancing age in the entire population, is due to an increased probability of short-term disability among those who suffer from long-term activity limitation. Altogether almost half of the total number of short-term disability days are attributable to the 12 per cent of the population who reported some long-term activity limitation.

Thus we see that health status does not just deteriorate with advancing age for everyone, as it might have appeared until now. It is rather that the size of the minority of persons suffering from serious chronic health problems increases while the majority of all age groups who remain free of such problems can expect to lead a healthy life—even at relatively advanced ages. This means that, except for short bouts with colds and flu, those of us who manage to avoid long-term disability can look forward to a fairly active, healthy existence over most of the lifespan.

Long-Term Disability

Based on their responses to Section V of the Interviewer Administered Questionnaire (IAQ) of the Canada Health Survey, household members were classified into four categories according to presence or absence and severity of long-term disability. In order of decreasing severity, the categories were as follows:

CDMAJ	Cannot do major activity
RMAJ	Restricted in the kind or amount of major activity
MINOR	Not restricted in major activity, but otherwise restricted
NOLTD	No long-term activity limitation

The term major activity refers to work, school, housework or play, depending on the age and labour-force status of the individual.

An analysis of the duration of long-term disability in the household population based on special tabulations of Canada Health Survey data showed that, for all levels of severity (MINOR, RMAJ and CDMAJ) and for both sexes, persons reporting any long-term limitation of activity had been limited, on the average, for 90 per cent of the preceding year. At early ages, the percentage of the preceding year spent with activity restriction was considerably less, probably reflecting the initial onset of chronic impairments at those ages. It should be noted that activity restriction at younger ages accounted for only a small portion of total long-term disability.

Because the questions on long-term disability in the Canada

Health Survey referred to current problems only, respondents who earlier in the year suffered an activity restriction from which they had since recovered were properly shown as having no current long-term disability. In addition, others shown as having no long-term disability at the time of the survey may well have contracted such a restriction later in the year, which would not have been picked up by the single interview survey technique employed. Thus the percentage of the survey population shown as having long-term limitation of activities is properly taken as an average annual rate of disability, rather than as the proportion of the population who, at some time during the year, suffered from a long-term activity restriction.

Categories of Activity Limitation

Persons in the household population were classified by the Canada Health Survey into four categories according to the extent to which their usual activities were limited at the time of the survey. These categories are based on the system of classification used in the United States Health Interview Survey, adapted to take account of minor changes in the Canadian definitions. Since the usual activities of pre-school children, school-age children, housewives, workers and other persons differ, a different definition of major activity was used for each group. There is a general similarity among them, however, as can be seen in the following descriptions of the four categories (National Center for Health Statistics, 1975, pp. 131-32):

CDMAJ: Cannot do major activity

Inability to take part in ordinary play with other children. Inability to go to school. Inability to do any housework. Inability to work at a job or business, or to engage in ordinary retirement activities.

RMAJ: Restricted in the kind or amount of major activity performed

Limited in amount or kind of play with other children; for example, need special rest periods, cannot play strenuous games, or cannot play for long periods at a time. Limited to certain types of schools or in school attendance; for example, need special schools or special teaching or cannot go to school full time or for long periods at a time. Limited in amount or kind of housework; for example, cannot lift children, wash or iron, or do housework for long periods at a time. Limited in amount or kind of work or retirement activities; for example, need special working aids or special rest periods at work, cannot work full time or for long periods at a time, or cannot do strenuous work.

MINOR: Not restricted in major activity, but otherwise restricted

Not limited in play but limited in other activities because of health. Not limited in going to school but limited in participation in athletics or other extra-curricular activities. Not limited in housework but limited in other activities such as church, clubs, hobbies, civic projects or shopping. Not limited in regular work activities but limited in other activities such as church, clubs, hobbies, civic projects, sports or games.

NOLTD: No long-term activity limitation

Not ordinarily limited in activities as described previously. This category includes persons with temporary or short-term limitations of normal activities (OSTD), as well as persons with chronic health problems or impairments not currently affecting their activities.

The latter group includes formerly disabled persons whose ordinary level of functioning has been restored by medication, corrective lenses, prostheses, as well as persons in the early, asymptomatic stages of a potentially serious disease.

Activity Restriction by Age and Sex

Figure 3.1 shows the percentage of persons in the household population who report any degree of chronic limitation of activities normal for persons of their age, as well as the average percentage of persons experiencing purely short-term disability not associated with long-term limitation. In comparing rates of long-term activity limitation with rates of purely short-term disability, it is clear that most activity restriction is associated with chronic health problems. It should be noted, however, that less than one fifth of the total number of persons restricted in their activities report being completely unable to work, go to school or do housework.

Table 3.1 shows that males more often than females are categorized as being unable to do their major activity, although this difference may be due in part to the way in which major activities are defined for each sex. Women who withdraw from the paid labour force for health-related reasons generally retain their unpaid housekeeping responsibilities, which then become their major activity. As housework is a self-directed activity, only fairly severely disabled women consider themselves completely unable to do it. On the other hand, men who have withdrawn from the labour force for health-related reasons are not apt to list their major activity as keeping house. Retired for health reasons (or simply retired) is more commonly reported. Thus, for a given degree of impairment, women are more likely than men to find themselves classified as "restricted in the kind or amount of major activity" (RMAJ) as opposed to "cannot do major activity" (CDMAJ). This "healthy worker" effect would also help explain why women in the labour force appear to be healthier than women not in the labour force: working women with health problems become housewives; those without such problems remain in the paid labour force.

Except for such differences in severity of reported limitation, however, both sexes show very similar patterns overall, with an average of about 12 per cent of the total household population reporting at least some restriction of activities.

The percentage reporting any activity restriction is less than 5 per cent until age 15, rising to about 10 per cent in the 25-44 age group, then doubling to over 20 per cent at ages 45-64, and nearly doubling again to almost 40 per cent of the household population at ages 65 and over. Although not shown here, rates of activity restriction in the household population increase only slightly from ages 65-74 to ages 75 and over.[4] This seems attributable to the high rates of institutionalization among Canada's elderly after age 75. (See Chapter Four for further information on the health status of Canadians aged 65-74 and 75 and over.)

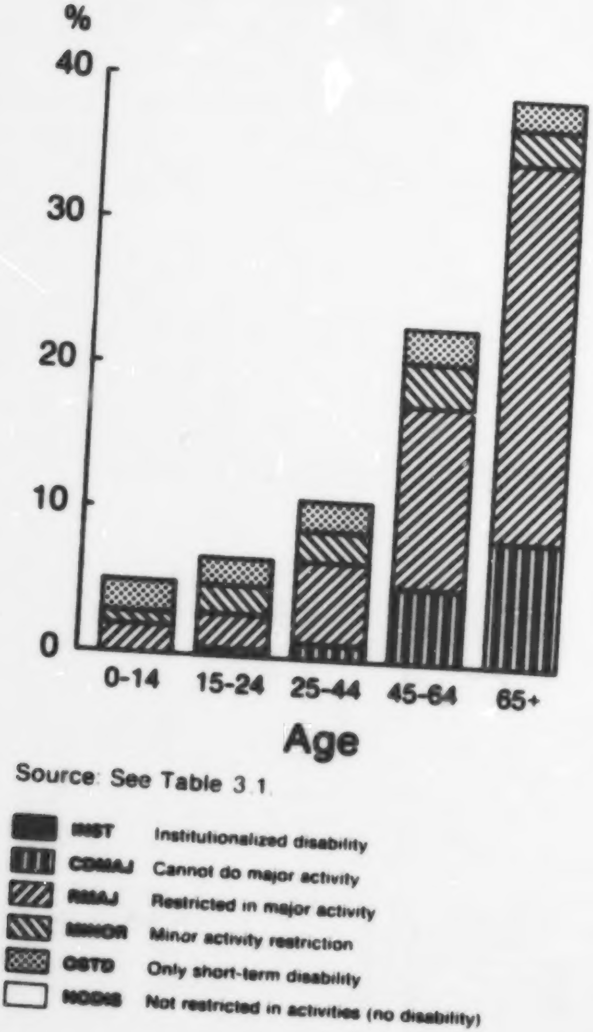
Leading Causes of Activity Limitation

> Ways of linking both life expectancy and expected disability of healthy persons to causes of death and disability are a crucial step in establishing the usefulness of social indicators for policy planning and evaluation.
>
> OECD (1976, pp. 62-63)

Figure 3.2 and Table 3.2 show the leading causes of long-term disability

Figure 3.1

Activity Restriction in the Household Population, Canada, 1978



Source: See Table 3.1.

TABLE 3.1

Activity restriction in the household population, by severity of restriction, by age and sex, Canada, 1978[a] (percentage)

Sex/Age	CDMAJ[b]	RMAJ[c]	MINOR[d]	OSTD[e]	NOHHD[f]	KNPOPLTD[g]	N
Males							
0-14	0.0	2.4	1.1	2.0	94.6	100.0	2 832 800
15-24	0.6	2.3	1.8	1.9	93.4	100.0	2 293 300
25-44	1.1	4.5	2.0	1.3	91.1	100.0	3 228 600
45-64	8.3	10.6	2.4	1.6	77.2	100.0	2 169 400
65+	13.7	22.3	2.1	0.9	61.0	100.0	886 700
All Ages	3.1	6.0	1.8	1.6	87.4	100.0	11 410 600
Females							
0-14	0.0	1.4	0.8	2.0	95.8	100.0	2 698 700
15-24	0.5	2.6	1.9	2.4	92.6	100.0	2 253 500
25-44	0.4	6.5	3.0	3.0	87.2	100.0	3 239 200
45-64	2.5	15.0	4.1	2.2	76.2	100.0	2 276 800
65+	4.9	29.3	4.1	1.8	60.0	100.0	1 132 400
All Ages	1.2	8.5	2.6	2.4	85.4	100.0	11 600 500
Total							
0-14	0.0	1.9	0.9	2.0	95.2	100.0	5 531 400
15-24	0.5	2.4	1.9	2.1	93.0	100.0	4 546 700
25-44	0.8	5.5	2.5	2.1	89.1	100.0	6 467 800
45-64	5.3	12.8	3.3	1.9	76.7	100.0	4 446 200
65+	8.7	26.2	3.2	1.4	60.4	100.0	2 019 000
All Ages	2.1	7.3	2.2	2.0	86.4	100.0	23 011 100

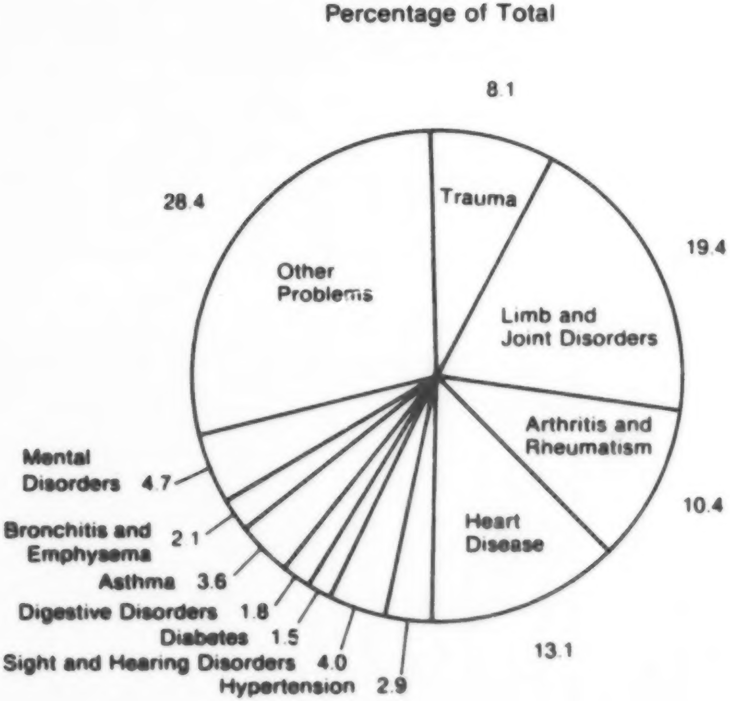
TABLE 3.1 (continued)

Source: Based on special tabulations from the Canada Health Survey, obtained from the Health Division, Statistics Canada, 1981.

Notes:
a. Based on survey data collected from July 1978 to March 1979.
b. Cannot do major activity (work, school, housework, etc.).
c. Restricted in major activity.
d. Minor activity restriction.
e. Only short-term disability.
f. No activity restriction as defined above.
g. Population for which the presence or absence of activity limitation was known.

Figure 3.2

Health Problems of Persons with Activity Limitation in the Household Population, Canada, 1978-79



Source: See Table 3.2

TABLE 3.2

Main health problems of persons with activity limitation in the household population, by sex, Canada, 1978 (percentage of all problems)

Health problem[a]	Males	Females	Total
Limb and joint disorders[b]	20.7	18.2	19.4
Heart disease	16.6	10.0	13.1
Arthritis and rheumatism	7.1	13.4	10.4
Trauma	9.4	6.9	8.1
Mental disorders	3.9	5.4	4.7
Asthma	4.1	3.3	3.6
Hypertension	2.4	3.3	2.9
Sight disorders	2.7	2.7	2.7
Bronchitis and emphysema	3.1	1.1	2.1
Digestive disorders	2.5	1.1	1.8
Diabetes	1.2	1.8	1.5
Hearing disorders	1.4	1.1	1.3
All other problems	24.8	31.7	28.4
Total	100.0	100.0	100.0
N	1247	1415	2662

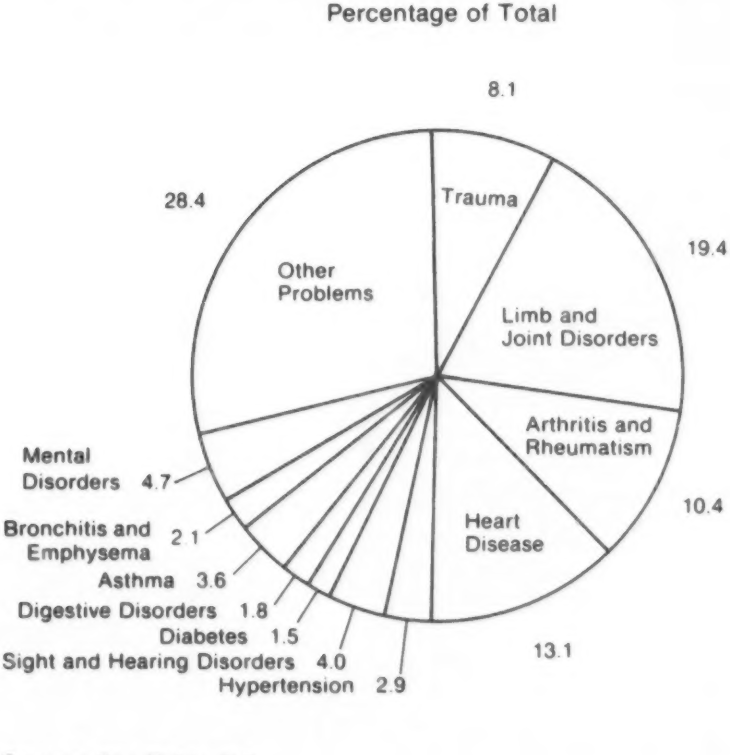
Source: Canada Health Survey (1981), Table 60.

Notes: a. Main health problem resulting in activity restriction; refers to self-described conditions.

b. It is not known what proportion of limb and joint disorders originally may have resulted from trauma.

Figure 3.2

Health Problems of Persons with Activity Limitation in the Household Population, Canada, 1978-79



Source: See Table 3.2

TABLE 3.2

Main health problems of persons with activity limitation in the household population, by sex, Canada, 1978 (percentage of all problems)

Health problem[a]	Males	Females	Total
Limb and joint disorders[b]	20.7	18.2	19.4
Heart disease	16.6	10.0	13.1
Arthritis and rheumatism	7.1	13.4	10.4
Trauma	9.4	6.9	8.1
Mental disorders	3.9	5.4	4.7
Asthma	4.1	3.3	3.6
Hypertension	2.4	3.3	2.9
Sight disorders	2.7	2.7	2.7
Bronchitis and emphysema	3.1	1.1	2.1
Digestive disorders	2.5	1.1	1.8
Diabetes	1.2	1.8	1.5
Hearing disorders	1.4	1.1	1.3
All other problems	24.8	31.7	28.4
Total	100.0	100.0	100.0
N	1247	1415	2662

Source: Canada Health Survey (1981), Table 60.

Notes:
a. Main health problem resulting in activity restriction; refers to self-described conditions.
b. It is not known what proportion of limb and joint disorders originally may have resulted from trauma.

in the household population. The four leading causes of activity limitation—limb and joint disorders, heart disease, arthritis and rheumatism, and trauma—together account for over half of all chronic disability in the household population. It should be noted that these are self-described conditions rather than medical diagnoses, and that only those health problems serious enough to restrict activity are included.[5]

The leading causes of long-term disability in the household population differ substantially from the major causes of death. In particular, cancers of all types are notable by their absence from the list of leading causes of disability for either sex. The leading causes of long-term disability also stand in sharp contrast to the leading causes of short-term disability—almost 40 per cent[6] of which is the result of colds and flu (Canada Health Survey, 1981, Table 60).

A combined analysis taking into consideration both causes of death and causes of disability would permit the ranking of health problems according to their overall impact of health expectancy, including loss of functional ability as well as loss of life itself. As Colvez (1979, pp. 4.23-4.25) emphasized in his study for the Quebec government, this might well lead to major changes in the relative priority accorded to each cause—with all the implications for health planning and policy making that that would entail. For example, some diseases, such as cancer, result in great loss of life but relatively little chronic disability. Others, such as arthritis and rheumatism, result in much disability but little loss of life. Still others, such as circulatory problems (heart disease, hypertension and stroke), result in great loss of life as well as a great deal of serious disability.

While the technical feasibility and policy relevance of such analyses have been clearly demonstrated, a number of practical difficulties remain to be dealt with before the loss of health expectancy due to each of the major causes of death and disability can actually be calculated. A major problem is that the diagnostic categories used on the various sets of records are not always comparable. For example, the Canada Health Survey results do not indicate what proportion of activity limitation due to limb and joint disorders may have originally resulted from accidents or violence. Other categories, however, such as heart disease and hypertension, may be similar enough in the two sources to permit a combined analysis using Canada Health Survey data on disability by health problem together with mortality data by cause of death from the vital statistics. An additional problem is that, ideally, cause-specific data on long-term institutionalization should be included, but this information is not collected at present for residents of special-care institutions, who account for nearly three quarters of total long-term institutionalization.[7]

Comparison with Results of the Canadian Sickness Survey of 1950-51

The Canadian Sickness Survey of 1950-51 was a household survey covering about 35 000 persons in all provinces except Newfoundland. Although many of the concepts used were too different to permit direct comparisons to be made with results of the Canada Health Survey of 1978-79, three of the disability measurements were sufficiently similar to make at least rough comparisons possible.

As shown in Table 3.3, the average annual number of bed-days per person remained virtually unchanged from 1950-51 to 1978-79 for most age groups of both sexes, except for males and females aged 45-64, where the number of bed-days per person increased marginally. Total short-term disability days per person remained stable for males, but increased substantially for females. (Note that both categories of short-term disability mentioned here include disability days attributable to persons suffering from long-term activity limitation.) Long-term disability as reported at the time of the survey appears to have increased substantially for both sexes, from an average of 8 per cent of men and 6 per cent of women in 1950-51, to 11 per cent of men and 12 per cent of women in 1978-79. The increase in long-term disability was thus about twice as great for women as it was for men. By comparison, the increase in life expectancy at birth over the same thirty-year period was 4.5 years for men compared to 7.5 years for women. It would appear then that part of the gains in overall life expectancy were obtained at the expense of increased disability.

Comparison with Current Rates of Activity Restriction in the United States

Table 3.4 shows Canada Health Survey data on disability in the

TABLE 3.3

Disability by age and sex in the Canadian Sickness Survey of 1950-51, compared to that in the Canada Health Survey of 1978-79; and life expectancy by age and sex in Canada, 1951 and 1978

Sex/Age	Short-Term Disability[a]				Long-Term Disability[b]		Life Expectancy[c]	
	Bed Days		Total Days		%		Years	
	1951	1978	1951	1978	1951	1978	1951	1978
Males								
0-14	5	4	11	9	2.4	4.0	66.3	70.8
15-24	3	3	8	9	2.4	4.0	55.5	57.2
25-44	4	3	9	8	7.1	7.6	46.2	48.1
45-64	6	6	17	21	14.7	21.3	28.1	29.6
65+	12	11	29	30	27.0	38.1	13.3	14.4
All Ages	5	4	12	13	7.9	11.0	--	--
Females								
0-14	5	4	10	9	2.1	3.5	70.8	78.3
15-24	5	4	9	12	2.1	3.5	59.2	64.5
25-44	6	5	10	19	5.1	9.8	49.7	54.8
45-64	7	9	15	27	11.5	21.6	31.1	35.7
65+	16	15	29	39	23.9	38.3	15.0	18.7
All Ages	6	6	12	19	6.3	12.2	--	--
Total								
0-14	5	4	10	9	2.3	3.7	68.6	74.6
15-24	4	4	8	10	2.3	3.7	57.3	60.9
25-44	5	4	9	14	6.1	8.7	47.9	51.5
45-64	7	7	16	24	13.1	21.4	29.6	32.7
65+	14	13	29	35	25.5	38.2	14.1	16.7
All Ages	6	5	12	16	7.1	11.6	--	--

TABLE 3.3 (continued)

Source: Disability data from Dominion Bureau of Statistics (1960b), Tables 17 and 20, and from special tabulations of the Canada Health Survey obtained from the Health Division, Statistics Canada, 1981. Life expectancy data from Dominion Bureau of Statistics (1960a) and from abridged life tables for 1977-1979, calculated by the authors from vital statistics and postcensal estimates of population.

Notes:

a. Average annual number of days, including hospital days. Total short-term disability days in 1951 refer to persons reporting any "disabling illness" (not including complaint days having no effect on activity).

b. Average percentage of population suffering either any "activity limitation" (1978 survey) or any "permanent physical disability" (1951 survey). The least severe category of permanent physical disability in the Canadian Sickness Survey of 1950-51 (Dominion Bureau of Statistics, 1960b, p. 25) included "all chronic disabilities, deformities and amputations which did not interfere to any practical extent in the day-to-day functioning on the job or at home."

c. Remaining years of life expectancy at the first of each pair of ages shown.

TABLE 3.4

Activity restriction in the household population, by severity of restriction, by age and sex, United States, 1978, and Canada, 1978

Sex/Age	Short-Term Disability[a]				Long-Term Disability[b]			
	Total Days[c]		Bed Days[d]		% with any[e]		% with any major[f]	
	Canada	U.S.A.	Canada	U.S.A.	Canada	U.S.A.	Canada	U.S.A.
Males								
0-14[g]	8.6	10.7	3.5	4.9	3.4	4.2	2.4	2.2
15-24[h]	8.9	10.5	2.9	4.1	4.7	9.1	2.9	5.5
25-44	7.7	13.9	2.6	4.5	7.6	9.1	5.6	5.5
45-64	21.1	23.2	6.4	7.3	21.3	24.3	18.8	19.7
65+	30.2	35.1	10.6	14.2	38.1	48.2	36.0	43.2
All Ages	12.5	16.3	4.2	6.0	11.0	14.3	9.1	10.8
Females								
0-14[g]	8.8	11.8	3.7	5.6	2.2	3.6	1.4	1.8
15-24[h]	12.0	14.0	4.4	6.8	5.0	7.9	3.1	4.9
25-44	19.4	18.3	5.0	7.1	9.8	7.9	6.9	4.9
45-64	27.2	28.1	8.5	10.1	21.6	23.0	17.5	17.5
65+	38.8	43.9	15.3	14.8	38.3	42.7	34.2	34.9
All Ages	18.9	21.1	6.3	8.2	12.2	14.1	9.6	10.3
Total								
0-14[g]	8.7	11.3	3.6	5.2	2.8	3.9	1.9	2.0
15-24[h]	10.5	12.3	3.7	5.5	4.9	8.5	3.0	5.2
25-44	13.6	16.2	3.8	5.8	8.7	8.5	6.3	5.2
45-64	24.2	25.8	7.5	8.8	21.4	23.6	18.2	18.6
65+	35.0	40.3	13.2	14.5	38.2	45.0	35.1	38.3
All Ages	15.7	18.8	5.3	7.1	11.6	14.2	9.4	10.6

TABLE 3.4 (continued)

Source: Based on special tabulations of the Canada Health Survey, obtained from the Health Division, Statistics Canada, 1981, and from the United States National Health Interview Study (National Center for Health Statistics, 1979), Tables 12 and 14.

Notes:
a. Includes short-term disability for persons with long-term activity limitation.
b. In the United States, applies only to persons reporting chronic health problems.
c. Includes bed days shown separately at right.
d. Includes short-term hospitalization.
e. Includes all severity categories, regardless of whether major activities were affected.
f. Restricted in or unable to do major activity (such as work, school or keeping house).
g. Ages 0-16 in the United States.
h. Ages 17-24 in the United States.

household population alongside of comparable data from the United States Health Interview Survey. When current age and sex-specific rates of activity restriction for the United States and Canada are compared, Canadians are seen to have a significant advantage over their American counterparts. Whether the indicator refers to short- or long-term disability, at both severe and moderate degrees of impairment, Canadians report lesser amounts of activity restriction in most age groups of both sexes.

In 1978, Canadians reported two fewer annual bed-days per person, and two fewer total short-term disability days, compared to Americans. The percentage of population reporting any degree of long-term activity limitation was 11 or 12 in Canada, compared to 14 in the United States. Fairly severe activity limitation (enough to restrict a person in the performance of normal work, school or housekeeping functions) was also somewhat more common in the United States than in Canada.

While reasonable comparisons can be made between Canadian and American rates of disability in the household population under age 65, comparisons of the rates at more advanced ages are of much less validity. Particularly in Canada, high rates of institutionalization among the elderly mean that large numbers of functionally impaired persons are simply withdrawn from the household population, thus reducing rates of disability calculated on the basis of the remaining non-institutionalized population.

Only when institutionalized as well as non-institutionalized disability are taken into account together can truly meaningful comparisons be made. As we have seen, this observation applies not only to international comparisons, but also to comparisons among regions within Canada. In addition, when time series data are also available, every effort should be made to include both institutional- and household-based data.

Chapter Four is a synthesis of the various components of our data on health status. Data on long-term institutionalization and household disability are first considered together. Then mortality data are added to the analysis, and the results are presented in terms of life expectancy in each of several states of health.

Notes

1. A special tabulation of Canada Health Survey data showing the duration of limitation for those reporting an activity limitation was also obtained. In the activity-limited population, 85 per cent had been limited at least a year. The other 15 per cent each averaged approximately 0.4 year of activity limitation during the year. The weighted average duration of activity limitation was thus 0.9 year per person reporting any activity limitation. (See Annex Tables 3.6 and 3.7.)

2. For a detailed explanation including a discussion of seasonal factors related to reporting of short-term disability, see Appendix III of The Health of Canadians (Canada Health Survey, 1981).

3. Conceptually, the questions on two-week disability in the Canada Health Survey were intended to elicit information on deviations from the level of functioning that was usual for the individual respondent, whether or not that usual level already involved restriction of activities normal for the age group. It is not certain, however, to what extent the survey questions on two-week disability actually succeeded in excluding disability due to long-term restrictions of activity. While the amount of two-week disability in the portion of the survey population reporting no long-term limitations was quite modest (three or four days per person per year, on average) and did not increase significantly with advancing age, the amount of two-week disability in the portion of the survey population that did report long-term limitations of activity was nearly ten times as high, and increased rapidly with advancing age. Therefore, although the amount of two-week disability for those without long-term disability clearly refers to short-term disability only, the same is not necessarily true for the amount of two-week disability in the total population. We do not know how much of the reported two-week disability for those with long-term activity restrictions may have actually been due to double counting of days of disability due to long-term

health problems.

4. Special tabulations of Canada Health Survey data on activity limitation and two-week disability were obtained for males and females in the household population aged 65-74 and 75 and over. The small sample sizes (875 males and 1013 females aged 65-74; 423 males and 599 females aged 75 and over) means that the margin of error is quite substantial. Nevertheless, the increase in long-term disability for both sexes from ages 65-74 to 75 and over was quite small (from 8.5 per cent to 9.1 per cent of the household population). However, as will be shown in Chapter Four (Figure 4.1), when long-term institutionalization is also taken into account, rates of activity restriction in the total population more than double from ages 65-74 to 75 and over (from less than 10 per cent to well over 20 per cent).

5. Over half of all persons, and 85 per cent of those aged 65 and over reported at least one health problem, while only about 12 per cent of all persons, and 49 per cent of those aged 65 and over reported conditions serious enough to limit them in their activities (Canada Health Survey, 1981, Tables 57 and 67).

6. Percentage based on all persons reporting any short-term disability, whether or not long-term disability was also involved. If our more restrictive definition of "only short-term disability"—excluding persons with long-term limitations—had been used instead, the percentage of short-term disability attributable to colds and flu would have been higher still.

7. By putting together data on disability in the household population with data on the number of persons resident in mental hospitals and in special-care facilities for the mentally handicapped or retarded, we see that fewer than one third of all mentally disabled or restricted persons in Canada live in institutions. The distribution is as follows: 126 000 persons not living in institutions are restricted in their activities due to mental health

problems, to which must be added 11 000 persons who are residents of mental hospitals, and 41 000 persons who are residents of special-care facilities for mentally handicapped or retarded, for a total of 178 000 mentally disabled (or restricted) persons in 1978. In addition, an appreciable proportion of short-term disability days and other health-related behaviours such as physician visits and drug-taking could be ascribed to mental health problems.

Chapter Four
SYNTHESIS OF THE VARIOUS COMPONENTS

The previous chapters have examined in turn each of the major types of available data on health status. Chapter One looked at mortality in the total population. Chapter Two covered long-term institutionalization. Chapter Three outlined what we know about disability in the household population. The time has now come for a synthesis of these various components. In the first part of this chapter, institutionalization and household disability are considered together. Then mortality data are added, and health expectancy is calculated. Finally, the possibilities of summarizing health expectancy data in terms of a single index are examined.

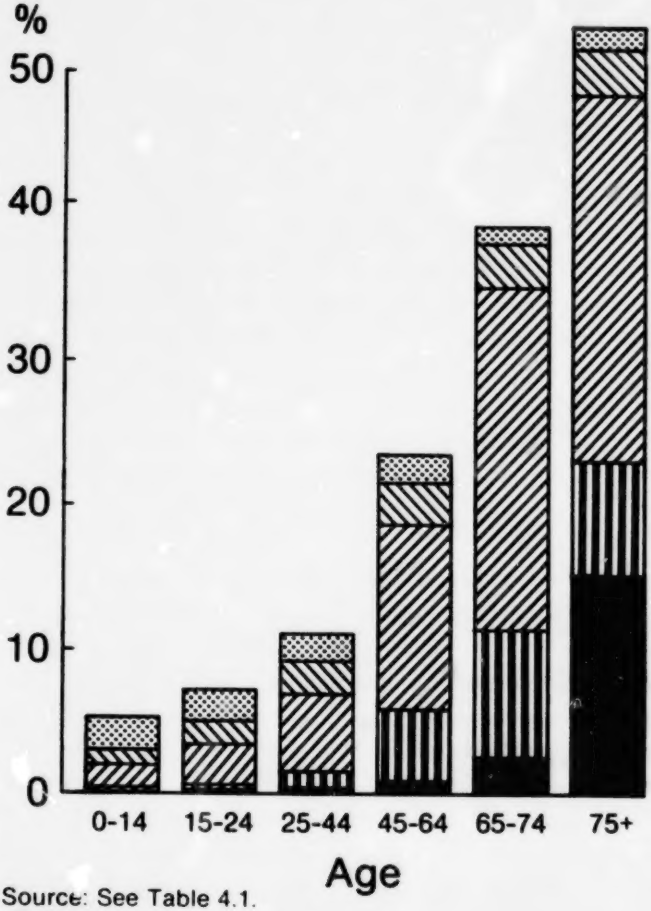
Activity Restriction in the Total Population

> The variety of factors that determine whether or not a disabled person resides in the community or in an institution suggests that comparisons of disability levels over time or between population subgroups should be based on the combined disability experience of both institutional and noninstitutional population groups.
>
> Sullivan (1971b, p. 22)

Figure 4.1 presents age-specific rates of various forms of activity restriction in the total population. Long-term institutionalization (INST) and inability to perform major activity (CDMAJ) are the most severe categories of disability shown. Less severe categories of activity restriction are represented by the categories restricted in

Figure 4.1

Activity Restriction in the Total Population, Canada, 1978



Source: See Table 4.1.

■	**INST**	Institutionalized disability
▥	**CDMAJ**	Cannot do major activity
▨	**RMAJ**	Restricted in major activity
▧	**MINOR**	Minor activity restriction
▒	**OSTD**	Only short-term disability
□	**NODIS**	Not restricted in activities (no disability)

major activity (RMAJ), restricted in other activities (MINOR), and only short-term disability (OSTD). The overall picture is one of increasingly greater activity limitation with advancing age, both in terms of the percentage of population affected and in terms of the severity of disability experienced.

Up to and including ages 25-44, better than nine tenths of the population is free of any health-related activity restriction. From ages 25-44 to 45-64, rates of most categories of activity restriction at least double. Still, in each group below the oldest (75 and over), no more than one tenth of the population is to be found in the two most severe categories of disability (INST and CDMAJ). At ages 75 and over, however, nearly one quarter of all Canadians were either institutionalized or otherwise unable to do their major activity. Another one quarter of Canadians aged 75 and over reported less severe long-term or short-term activity restrictions.

Table 4.1 provides additional detail on disability in the total population, with rates for men and women shown separately. As was reported in Chapter Two, rates of institutionalization are somewhat higher for men until ages 65-74, at which point rates for women become marginally greater. At ages 75 and over, rates of institutionalization are considerably higher for women than for men. As was noted in Chapter Three, the percentages of men and women in the household population who report being either restricted in, or completely unable to do, their major activity are quite similar at all ages, although men are much more likely than women to report being completely unable to do their major activity, while women are more likely to report being only restricted in their ability to do their major activity.

It is not known to what extent these differences in severity of reported disability reflect real differences in health status between the sexes, and to what extent they are artifacts of the way in which the categories are determined in each case. Moreover, the imprecision and ambiguity of the present categories argue against trying to make very much of differences between any two adjacent categories of severity of activity restriction.

TABLE 4.1

Activity restriction in the total population, by severity of restriction, by age and sex, Canada, 1978[a] (percentage)

Sex/Age	INST	CDMAJ	RMAJ	MINOR	OSTD	NODIS	POPTOT	N
Males								
0-14	0.2	0.0	2.3	1.0	2.0	94.5	100.0	2 911 800
15-24	0.3	0.6	2.2	1.8	1.8	93.3	100.0	2 346 700
25-44	0.3	1.1	4.4	2.0	1.2	90.9	100.0	3 284 600
45-64	0.6	8.2	10.4	2.4	1.5	77.0	100.0	2 202 600
65-74	2.3	14.2	20.4	1.9	1.0	60.3	100.0	614 300
75+	11.2	11.1	23.2	2.3	0.8	51.4	100.0	310 800
All Ages	0.7	3.0	5.9	1.8	1.6	87.0	100.0	11 670 800
Females								
0-14	0.1	0.0	1.4	0.7	2.0	95.7	100.0	2 770 900
15-24	0.2	0.5	2.5	1.9	2.4	92.5	100.0	2 285 400
25-44	0.2	0.4	6.5	3.0	3.0	87.0	100.0	3 241 800
45-64	0.5	2.5	14.9	4.1	2.1	76.0	100.0	2 297 800
65-74	2.6	3.8	27.4	3.9	1.6	60.7	100.0	724 600
75+	17.5	5.7	27.5	3.7	1.6	44.0	100.0	484 500
All Ages	1.1	1.1	8.3	2.5	2.3	84.6	100.0	11 805 000
Total								
0-14	0.2	0.0	1.9	0.9	2.0	95.1	100.0	5 682 700
15-24	0.2	0.5	2.4	1.8	2.1	92.9	100.0	4 632 100
25-44	0.2	0.7	5.4	2.5	2.1	89.0	100.0	6 526 400
45-64	0.6	5.2	12.7	3.2	1.9	76.5	100.0	4 500 400
65-74	2.4	8.5	24.2	3.0	1.3	60.5	100.0	1 338 900
75+	15.0	7.8	25.8	3.1	1.3	46.9	100,0	795 300
All Ages	0.9	2.1	7.1	2.2	2.0	85.8	100.0	23 475 800

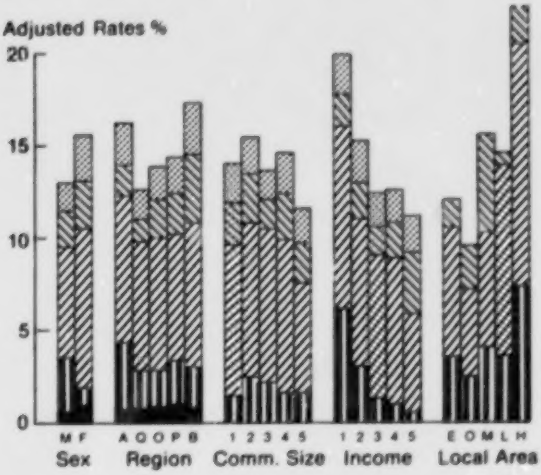
TABLE 4.1 (continued)

Source: For institutionalized disability, see Table 2.1.
For non-institutionalized disability, see Table 3.1.

Note: a. Exact dates vary depending on category of disability. For definitions and explanations of the categories, see Chapters Two and Three.

Figure 4.2

Disparities in Activity Restriction, by Sex, Region, Community Size, Income and Local Area, Canada, Late 1970's



Source: See Table 4.2.

Notes:
Regions — A = Atlantic provinces; Q = Quebec; O = Ontario; P = Prairie provinces; B = British Columbia

Community-size groups — 1 = less than 1000 and rural; 2 = 1000-9999; 3 = 10 000-99 999; 4 = 100 000 -999 999; 5 = 1 000 000 and over.

Income levels — 1 = lowest quintile; 5 = highest quintile.

Local areas — E = N.D.G.-Est/Westmount; O = N.D.G.-Ouest/Montréal-Ouest; M = Métro; L = Saint-Louis du Parc/Mile End; H = Saint-Henri/Petite Bourgogne.

■	**INST**	Institutionalized disability
☐	**CDMAJ**	Cannot do major activity
▨	**RMAJ**	Restricted in major activity
▧	**MINOR**	Minor activity restriction
▩	**OSTD**	Only short-term disability
☐	**NODIS**	Not restricted in activities (no disability)

Disparities in Activity Restriction

For all ages together, Figure 4.2 and Table 4.2 show how rates of activity restriction vary by sex, region, community size and local area. (The rates shown have been adjusted to eliminate differences due solely to the particular age-sex composition of various populations.) As previously noted, females are more likely than males to report being restricted in their activities, although males are more likely to report being unable to do their major activity. Among the five regions of Canada, while British Columbia has the highest total rate of activity restriction, this is largely due to elevated rates for the less severe categories of restriction. The high rates in the Atlantic region, however, are mostly due to elevated rates for the more severe categories of activity restriction.

By community-size group, for all severity categories taken together, rates of activity limitation are considerably lower in the largest metropolitan areas than elsewhere in Canada. For the two most severe categories of activity limitation shown (CDMAJ plus RMAJ), rates decrease with increasing size of urban areas, while rates for rural areas are close to the Canadian average.

By income level, rates of activity restriction are strikingly highest in the lowest income group, and lowest in the highest income group. (Note that income levels were determined by family income after adjustment for family size and community size.) Rates of activity restriction by local area are closely related to indicators of social class such as income, education and occupation. Upper- and middle-class neighbourhoods have low rates of activity restriction, while lower-class neighbourhoods have very high rates, and intermediate areas have about average rates. (Rates by local area are based on a partial replication of the Canada Health Survey, which was carried out in several neighbourhoods of Montreal during 1979 and 1980.)

Mortality and Activity Restriction

Until mortality data are brought together with the data on activity restriction among the living, our view of health is necessarily incomplete, as mortality trends alone tell us little or nothing about changes in the health status of the living. Data from the United States

TABLE 4.2

Disparities in activity restriction, by sex, region, community size, income and local area, Canada, 1978 (age and sex-adjusted percentage rates)[a]

	Activity Restriction[b]					
	INST	CDMAJ	RMAJ	MINOR	OSTD	TOTAL
Sex						
Male	0.7	3.0	5.9	1.8	1.6	13.0
Female	1.1	1.1	8.3	2.5	2.3	15.4
Total	0.9	2.1	7.1	2.2	2.0	14.2
Region						
Atlantic	0.8	3.4	7.8	1.9	2.2	16.1
Quebec	0.8	2.1	6.7	1.5	1.5	12.6
Ontario	0.9	2.0	6.8	2.2	1.9	13.9
Prairies	1.0	1.4	7.7	2.2	2.1	14.4
British Columbia	0.9	2.2	7.7	3.7	2.7	17.2
Community Size						
Less than 1 000 and rural	n/a	1.7	7.9	2.3	2.2	14.1
1 000 to 9 999	n/a	2.8	8.1	2.7	1.9	15.4
10 000 to 99 999	n/a	2.4	7.9	1.9	1.7	13.8
100 000 to 999 999	n/a	1.8	8.1	2.4	2.2	14.7
1 000 000 and over	n/a	1.8	5.7	2.1	1.9	11.5
Income Level						
Lowest	n/a	6.2	9.7	1.8	2.1	19.9
Second	n/a	3.1	7.9	2.1	2.0	15.1
Third	n/a	1.5	7.2	1.9	1.8	12.5
Fourth	n/a	1.2	7.5	2.1	1.9	12.7
Highest	n/a	0.7	5.1	3.4	2.1	11.2
Local Area[c]						
St-Henri/ Petite Bourgogne	n/a	7.3	13.1	2.1	n/a	22.5
St-Louis	n/a	3.8	10.2	0.6	n/a	14.6
Métro	n/a	4.2	6.2	5.2	n/a	15.6
N.D.G.-Ouest/ Montréal Ouest	n/a	2.8	4.4	2.1	n/a	9.4
N.D.G.-Est/ Westmount	n/a	3.7	7.0	1.4	n/a	12.1

Source: Based on special tabulations of Canada Health Survey data, except in the case of rates by local area, which are based on a local replication of the Canada Health Survey.

TABLE 4.2 (continued)

Notes:

a. Adjusted to the Canada 1978 age-sex structure except in the case of rates by local area, which were adjusted to the local 1976 age-sex structure.

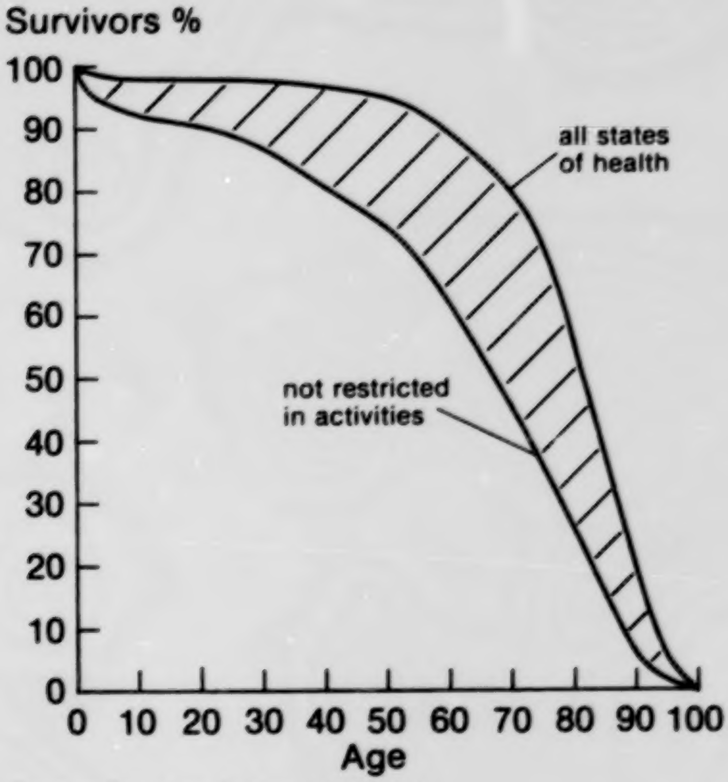
b. Column headings are abbreviated as follows: INST = institutionalized; CDMAJ = cannot do major activity; RMAJ = restricted in major activity; MINOR = minor activity restriction; OSTD = only short-term disability.

c. Rates shown are for 1979-80; areas referred to are service districts of the Department of Community Health, Montreal General Hospital.

Figure 4.3

Health Status of Survivors, by Age and Sex, Canada, 1978

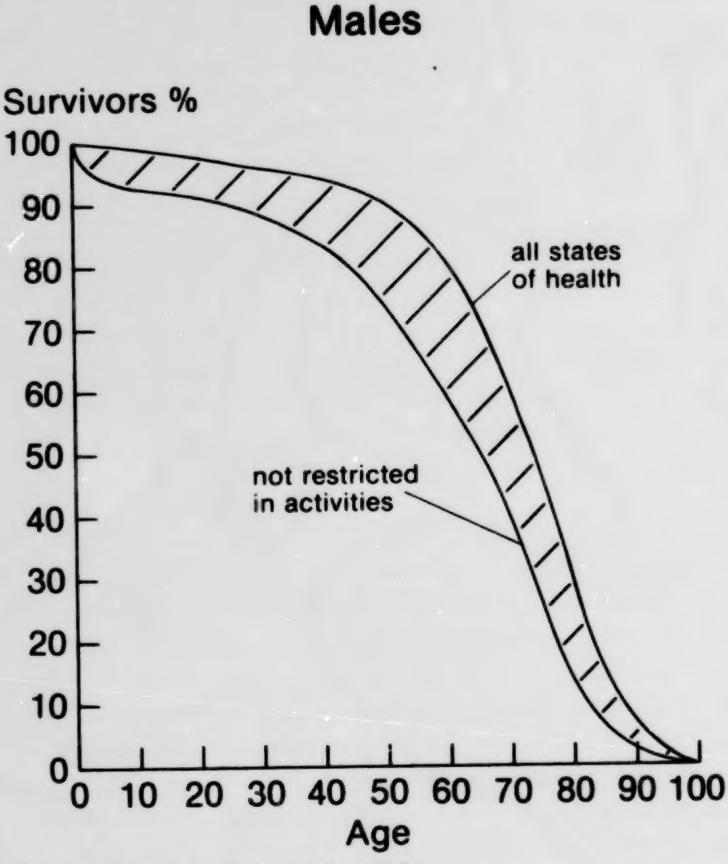
Females



Source: Based on Tables 1.1 and 4.1.

Figure 4.3

Health Status of Survivors, by Age and Sex, Canada, 1978



Source: Based on Tables 1.1 and 4.1.

discussed in the Introduction suggest that the possibility of countervailing trends in mortality and disability should be anticipated. Indeed, increased probability of survival may often be linked with greater prevalence of activity restriction.

Figure 4.3 shows the survival curve for each sex along with the percentage of the initial population at each age that is expected to be not only alive but also free of any activity restriction due to impaired health. A comparison of the curves for men and women reveals two facts that might not have been apparent before.

First, in spite of appreciably higher death rates among men, the percentage of the initial population that is free of any activity restriction is actually somewhat higher for men than women—until retirement ages. After that time, however, the greater longevity of women is more than enough to compensate for their higher rates of disability, and this is reflected in the restriction-free survival curves.

Secondly, although we tend to think of health impairment as being concentrated in the later years of life, this is, in fact, only true of rates of disability among the surviving population. The greatest part of the total volume of activity restriction (as represented by the shaded area between the two curves) actually occurs during the working years (ages 25-64).

Health Expectancy

Procedures

Health expectancy depends on the probability of surviving to a given age as well as on the likelihood that the survivors will be free of activity restriction (or restricted to a greater or lesser extent). Figure 4.3 illustrated one way of presenting mortality and disability data together. Health expectancy is an even more concise way of summarizing the same data elements. In addition, health expectancy has the advantage of being expressed in concrete, easily understood terms: years of life expectancy in each state of health.

The calculation of health expectancy requires us to bring together the three main components of our existing information on population health status: mortality data from the vital statistics, institutional data from long-term care facilities, and survey data on disability in the

TABLE 4.3a

Procedures for the calculation of health expectancy

---

1. Mortality (L and LL) -- from life tables

   L = Number living (survivors)

   LLALL = Life years lived (all states of health)

2. Institutionalization (INST) -- from annual returns, etc.

   $\mathrm{INST} = \mathrm{LTU}^{a} + \mathrm{MHL}^{b} + \mathrm{SCFN}^{c}$

   $\mathrm{RINST} = \mathrm{INST} \div \mathrm{POPTOT}^{d}$

   $\mathrm{LLINST} = \mathrm{LLALL} \times \mathrm{RINST}$

   $\mathrm{LLREM} = \mathrm{LLALL} - \mathrm{LLINST}$

3. Household disability (HHD) -- from health surveys

   $\mathrm{HHD} = \mathrm{CDMAJ}^{e} + \mathrm{RMAJ}^{f} + \mathrm{MINOR}^{g} + \mathrm{OSTD}^{h}$

   $\mathrm{RHHD} = \mathrm{HHD} \div \mathrm{POPHH}^{i}$

   $\mathrm{LLHHD} = \mathrm{LLREM} \times \mathrm{RHHD}$

4. Life expectancy in each state (ES)

   $\mathrm{ESALL} = \mathrm{TLLALL}^{j} \div \mathrm{L}$

   $\mathrm{ESINST} = \mathrm{TLLINST}^{k} \div \mathrm{L}$

   $\mathrm{ESHHD} = \mathrm{TLLHHD}^{l} \div \mathrm{L}$

5. Quality-adjusted life expectancy (QAL) -- weighting all states

   $\mathrm{QAL} = 1.0 \times \mathrm{ENODIS} + 0.3 \times \mathrm{ESINST} + 0.5 \times \mathrm{ESHHD}$

Notes:	a.	LTU:	Long-stay units of general and allied special hospitals.
	b.	MHL:	Mental hospitals less short-stay public psychiatric hospitals.
	c.	SCFN:	Non-self-sufficient residents of special-care facilities.
	d.	POPTOT:	Total population.
	e.	CDMAJ:	Cannot do major activity (work, school, housework).
	f.	RMAJ:	Restricted in major activity.
	g.	MINOR:	Minor activity restrictions.

TABLE 4.3a (continued)

h. OSTD: Only short-term disability.
i. POPHH: Household population for which the presence or absence of long-term activity limitation was known.
j. TLLALL: Sum of all LLALL.
k. TLLINST: Sum of all LLINST.
l. TLLHHD: Sum of all LLHHD.

TABLE 4.3b

Example of calculation of expected years of institutionalization and of non-institutionalized disability for males, Canada, 1978[a]

Age	Survivors		Institutionalization[b]			
X	L	LLALL	RINST	LLINST	TLLINST	ESINST
0	100 000	1 475 419	.0020	3 008	75 702	0.8
15	98 004	972 823	.0029	2 838	72 694	0.7
25	96 408	1 896 306	.0027	5 195	69 856	0.7
45	92 509	1 699 064	.0059	10 050	64 661	0.7
65	72 274	1 037 206	.0527	54 611	54 611	0.8

Age	Survivors		Non-institutionalized disability[c]			
X	L	LLREM	RHHD	LLHHD	TLLHHD	ESHHD
0	100 000	1 472 411	.0540	79 986	1 081 272	10.8
15	98 004	969 985	.0660	63 644	1 001 286	10.2
25	96 408	1 891 111	.0890	168 395	937 642	9.7
45	92 509	1 689 014	.1280	385 717	769 247	8.3
65	72 274	982 595	.3900	383 530	383 530	5.3

Notes:

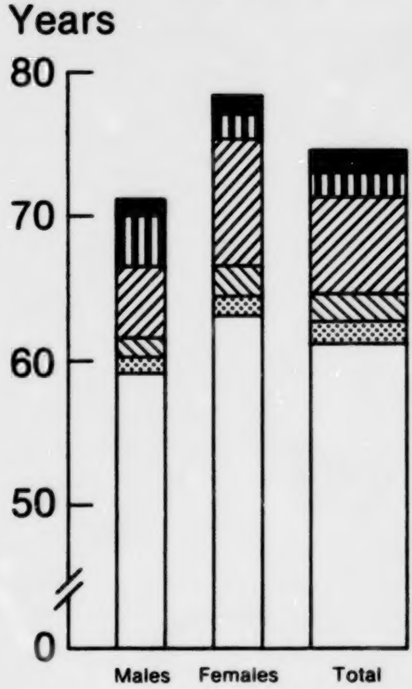
a. For definition of abbreviations used in column headings, see Table 4.3a.

b. Including long-term units of hospitals, mental hospitals and special-care facilities.

c. Including any long-term limitation of activity plus other short-term disability.

Figure 4.4

Health Expectancy at Birth, by Sex, Canada, 1978



Source: See Table 4.4

■	**INST**	Institutionalized disability
▥	**CDMAJ**	Cannot do major activity
▨	**RMAJ**	Restricted in major activity
▧	**MINOR**	Minor activity restriction
▩	**OSTD**	Only short-term disability
□	**NODIS**	Not restricted in activities (no disability)

TABLE 4.4

Health expectancy at birth, by sex, Canada, 1978[a] (in years)

State of health	Males	Females	Total
Long-term institutionalization	0.8	1.5	1.1
Cannot do major activity	3.0	1.3	2.1
Restricted in major activity	5.4	8.7	7.1
Minor activity restriction	1.3	2.2	1.8
Only short-term disability	1.1	1.8	1.4
Not restricted in activities	59.2	62.8	61.0
Total life expectancy	70.8	78.3	74.6

Note: a. From synthesis of data on mortality, institutionalization, and non-institutionalized disability, as explained in Chapter Four.

household population. Once compatible data on each of the components are available, the calculation of life expectancy in each state of health is quite straightforward.

The procedures employed in the calculation of health expectancy are summarized in Table 4.3, which also shows a simplified example of the calculation of expected years of institutionalization and expected years of household disability for Canadian males. Life years lived between two ages as shown in the LL column of the life table are simply subdivided into life years lived in each of the six mutually exclusive states of health (INST, CDMAJ, RMAJ, MINOR, OSTD, NODIS). This breakdown is accomplished by applying the age-specific rates of disability to all person-years of life lived (LLALL), or to person-years of life lived exclusive of institutionalization (LLREM).[1] The sum of all person-years of life lived in a given state of health is then divided by 100 000 (or by the number of survivors at a given age, if only life years lived from that age on are summed), yielding the number of years expected to be spent in each state of health.

Results

For Canada in 1978, Figure 4.4 and Table 4.4 show the average expected number of years of life in various states of health or disability. It can be seen that while women outlive men by 7.5 years, that difference is reduced by nearly half if only years free of health-related activity restriction are considered.

Canadian women can expect to spend an average of approximately 1.5 years as a resident of some kind of long-term health care institution (INST), compared to only half that time on average for Canadian males. This difference is due to higher rates of institutionalization for females at a given age, as well as to their longer life expectancy, which means that more women survive until the advanced ages when institutionalization becomes common.

On the other hand, male-female differences in the expected time spent with short-term disability not accompanied by long-term disability (OSTD) are mostly due to the greater propensity of women of all ages to report temporary functional disability. As was pointed out in Chapter Three, the rate of purely short-term disability hardly varies with advancing age for either sex.

Expected years of chronic activity limitation not involving long-term institutionalization (CDMAJ, RMAJ, MINOR) are 9.7 for men and 12.2 for women. As was seen in Table 4.1, the percentages of males and females in the household population reporting any long-term disability are fairly similar at each age. Thus the additional 2.5 years of expected long-term activity limitation for females are largely due to their greater life expectancy, which allows most women to survive to ages where nearly half of all persons in the household population suffer some sort of chronic limitation of activities. Men, on the other hand, are more likely to die prior to that time. Clearly, there is a trade-off of sorts between greater length of life and somewhat reduced health status.

One way of attempting to account for trade-offs of this kind is through the calculation of an index combining both the length and quality aspects of healthfulness in a single figure. This summary index, known as quality-adjusted life expectancy, is discussed next. Later, examples will be given of the usefulness of this summary index for comparative purposes.

Quality-Adjusted Life Expectancy

Health expectancy provides a detailed description of the distribution of life years lived in each of six mutually exclusive states of health and disability. In 1978, years of restricted activity amounted to 16 and 20 per cent of the total expected lifetime of men and women, respectively. Life expectancy at birth is thus only a partial indicator of population health status in its broader sense.

Breaking down the overall life expectancy figure into six categories, as we have done so far, helps us to summarize a wealth of previously dispersed information on mortality, institutionalization, and non-institutionalized disability. However, for comparative purposes, even this amount of detail makes the determination of relative healthfulness a difficult task.

For example, it will be seen in Chapter Five that Quebec males, with the lowest overall life expectancy of Canada's five regions, have the greatest number of expected years of life free of activity restriction. But does that mean that they are better off in terms of health than their Ontario counterparts, who live longer on the average, but with a greater number of years of restricted activity? The answer is not immediately obvious, nor will it necessarily be the same for all observers, as it depends on the relative values attached to each of the various states of health.

In order to compare the level of health of various regions or classes, a way is needed to summarize expected life years in the various functional states. What is required is a set of weights (relative values) to be assigned to each state in order to establish units of equal value in terms of social preference. Such units could then be summed to yield a sort of "quality-adjusted" life expectancy—a summary index of health combining mortality and several aspects of morbidity into a single value.

Most everyone would rather be well than sick, fully functional rather than handicapped, and, whenever possible, live in the community rather than an institution. Clearly, a year of life free of disability (or with less severe limitation) has a higher social preference than one lived in a less healthy state. However, completely disregarding the value of years spent with activity restriction (for example, by looking only at disability-free life expectancy) would be to ignore the substantial amount of social value attached to life itself, even in the presence of disability. This is particularly true when the activity restriction considered is a relatively minor one.

In the following section, we describe the way in which we have assigned weights to each of the six states of health defined earlier in this study. While some justification is given for the relative value of the weights chosen, it should be emphasized that these figures are subjective judgements only. Depending on the purpose of the exercise, or on the observer, the values chosen might differ substantially from the ones shown here. Our weights are thus arbitrary, and only intended to demonstrate the possibility of combining the detailed indicators into a single summary index where that may be required.

The six states of health described in this study are defined in terms of a single dimension: functional ability to carry out normal role activities. The six states can be ordered in terms of increasing severity of limitation in the capacity to perform those activities. Indeed, in most cases, such an ordering seems natural and unambiguous, although in certain cases (such as that of relatively healthy persons living in institutions, and that of persons with severe, though temporary, disability), the rank order is not so obvious.

Expected years of life are broken down into three broad categories: years free of restriction of normal activities, years with short-term disability only, and years with long-term activity limitation (whether at home or in an institution). Each state of health is then rated on a scale of 0.0 (for death) to 1.0 (for unimpaired health). (In the explanation that follows, the terms "persons" and "person-years" will be used interchangeably in reference to long-term disability. In reference to short-term disability, however, the two terms are not synonymous, and care will be taken to distinguish between them.)

The long-term disability category is further subdivided into four states of health: institutionalization (INST) and three levels of non-institutionalized disability (CDMAJ, RMAJ, MINOR).

- INST. All persons who are long-term residents of institutions for purposes of health care are lumped together in the most severely disabled state: INST. (This is clearly an over-simplification. A finer analysis would regroup these persons according to the actual severity of disability represented.) For purposes of computation of the combined index shown in the following examples, person-years of life in the institutionalized state (INST) have arbitrarily been assigned an average "social preference" value of 0.4.

Each of the following states applies to the non-institutionalized population only.

- CDMAJ. Persons chronically unable to perform their major activities—whether play, school, housework, paid employment or retirement activities—are grouped in the next most severe state of disability: CDMAJ. Person-years of life in this category have been assigned a value of 0.5.
- RMAJ. Persons chronically restricted in the kind or amount of major activity that they are able to perform are classified RMAJ. Person-years of life in this state are assigned a value of 0.6.
- MINOR. Persons able to perform their major activities, but

restricted in other activities, such as social, cultural or recreational activities, are classified MINOR. Person-years of life in this state are assigned a value of 0.7.

The short-term disability category presently has but one state of health: OSTD.

- OSTD. Person-years of life free of long-term activity limitation (that is, not in any of the above four classifications), but with a short-term impairment resulting in a temporary inability to carry out major or minor activities, are classified OSTD. Person-years of life in this state are assigned a value of 0.5. This category could also be disaggregated and weighted according to the actual severity of disability suffered.

Note that the vast majority of the population of all ages falls into this category periodically, whereas most people manage to avoid the long-term disability states over most of their lives.

The disability-free category, NODIS, is not further subdivided at present, although it could be in the future.

- NODIS. Person-years of life free of any of the above categories of activity restriction are classified NODIS. These years are assigned a value of 1.0.

It will be noted that the difference in value assigned to adjacent states of activity restriction is only 0.1. This is to reflect the nature of the classification system used, in which relatively small differences in behavioural response to health impairment are considered, rather than the underlying conditions themselves. Thus the same underlying condition—depending on a person's age, sex, major activity status, home-care service availability, and so forth—would not necessarily result in the same classification in every case.

For example, an elderly widow living alone may have to be institutionalized as a result of a condition no more severe than that formerly suffered by her now-deceased husband, except that while she was able to care for him at home, the home-care services she needs may be unavailable in her community. She would be classified INST, while he would have been CDMAJ.

In recent years, the widespread policy of deinstitutionalization of the mentally ill has resulted in a reclassification of many persons from

INST to CDMAJ, although their underlying health problems may well have remained unchanged.

Similarly, the difference between the CDMAJ, RMAJ and MINOR classifications may depend on the type of work performed. For example, a back injury resulting in a CDMAJ for a labourer might only produce an RMAJ or MINOR for a typist or musician, while the loss of a finger or two might have the opposite results.

The weights assigned here to the various states of health are for purposes of illustration only. Using the weights given above applied to the number of years in each state of health shown in Table 4.4, quality-adjusted life expectancy for Canadian males at birth would be 65.7 years (0.4 x 0.8 + 0.5 x 3.0 + 0.6 x 5.4 + 0.7 x 1.3 + 0.5 x 1.1 + 1.0 x 59.2 = 65.7). As the calculation of quality-adjusted life expectancy is so simple, involving as it does nothing more than the summation of the expected weighted years in each category, the reader can easily try out the effect of assigning other weights to the states.[2] It will soon be noted that, as long as 1.0 is used for NODIS and values between 0.0 and 1.0 are used for each of the other states, any results in terms of quality-adjusted life must lie somewhere in the range between what we have called disability-free life expectancy (free of any health-related activity restriction) and ordinary life expectancy (in all states of health).

In an article in the Journal of Chronic Diseases, McMaster University epidemiologist David Sackett and health economist George Torrance (1978) examined the preferences of individual Canadians for various health states. From the results of a survey in the Hamilton area (N = 275), they showed that the perceived utility of each state depended on factors such as prospects for recovery, the state of health of the respondent, as well as the severity of the condition described. Nevertheless, they found that, on a scale ranging from 0.0 for death to 1.0 for perfect health, most respondents assigned the disabled states values between 0.4 and 0.7. While Sackett and Torrance's detailed descriptions of health problems are not directly comparable to our broad categories of impairment, their results are nevertheless an indication that our arbitrarily assigned weights cannot be too wildly off the mark.

Chapter Five describes the distribution of health expectancy in Canada along three important dimensions: demographic, regional and social. In each case, health expectancy is presented first in terms of expected years of life in each state of health, then the detailed results are summarized in terms of quality-adjusted life expectancy.

Notes

1. Note that the rate of institutionalization is based on the total population, and is thus applied to all person-years of life lived (LLALL), while all other disability rates are based on the Canada Health Survey population and are thus applied only to the non-institutionalized portion of total life years lived (LLREM = LLALL - LLINST). As the non-institutionalized population is somewhat greater than the Canada Health Survey population, applying rates derived from the Canada Health Survey to the total non-institutionalized population implicitly assumes that persons in the residual categories (Indians on reserves, prisoners, military personnel, and residents of the Yukon and Northwest Territories) have the same rates of disability as do persons in the Canada Health Survey population. This assumption probably results in a slight underestimation of disability in the total population.

2. For example, if the weights chosen were INST = 0.2, CDMAJ = 0.3, RMAJ = 0.5, MINOR = 0.75, OSTD = 0.9 and NODIS = 1.0, then quality-adjusted life expectancy for Canadian males at birth would be 64.9 years (0.2 x 0.8 + 0.3 x 3.0 + 0.5 x 5.4 + 0.75 x 1.3 + 0.9 x 1.1 + 1.0 x 59.2 = 64.9). Thus by assigning less weight to the more severe categories of disability, but greater weight to the less severe categories, quality-adjusted life expectancy for Canadian males would be reduced by 0.8 years.

Chapter Five
DISTRIBUTION OF HEALTH EXPECTANCY

Health expectancy is a way of integrating data on mortality, long-term institutionalization, and disability in the household population. It is a comprehensive index of population health status.

This chapter examines the demographic, regional and social dimensions of the distribution of health expectancy in Canada. Age and sex differences in health expectancy are presented first. Next, regional disparities in the healthfulness of life and differences by community-size group are examined. Finally, the relationship of health expectancy to income and local area is discussed.

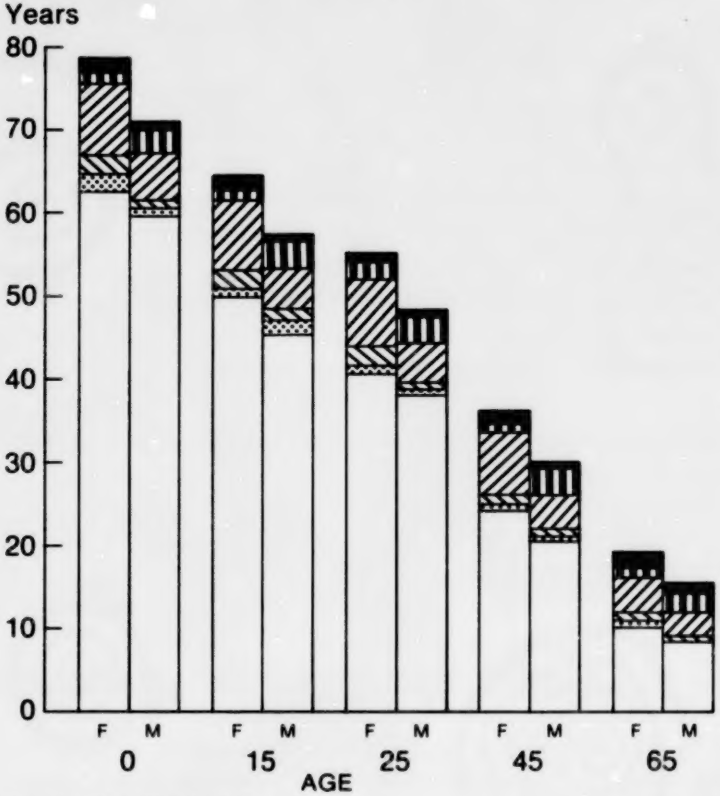
Health Expectancy by Age and Sex

Differences in health expectancy between males and females were referred to in Chapter Four. Additional information for each sex at various ages is shown in Figure 5.1 and Table 5.1.

Males and females are both similar and different in terms of health expectancy, depending on the particular aspects of health expectancy that are considered. For both sexes, nine tenths of all expected years of impaired health are accounted for by the various categories of long-term disability (including both institutionalized and non-institutionalized forms). Purely short-term disability (that is, not accompanied by chronic activity limitation) accounts for only about 10 per cent of total disability for both sexes. As shown in Table 5.1, males and females are also similar in that their quality-adjusted life expectancy amounts to almost the same percentage of their respective

Figure 5.1

Health Expectancy by Age and Sex, Canada, 1978



Source: See Table 5.1.

■	**INST**	Institutionalized disability
▥	**CDMAJ**	Cannot do major activity
▨	**RMAJ**	Restricted in major activity
▧	**MINOR**	Minor activity restriction
▩	**OSTD**	Only short-term disability
□	**NODIS**	Not restricted in activities (no disability)

TABLE 5.1

Health expectancy by age and sex, Canada, 1978 (in years and percentage of remaining life expectancy)

Sex/Age	Life Expectancy[a] Remaining		Quality-Adjusted[b] Life Expectancy		Disability-Free[c] Life Expectancy	
	N	%	N	%	N	%
Males						
0	70.8	(100)	65.8	(93)	59.2	(85)
15	57.2	(100)	52.4	(92)	46.2	(81)
25	48.1	(100)	43.5	(90)	37.6	(78)
45	29.6	(100)	25.6	(86)	20.6	(70)
65	14.4	(100)	11.5	(80)	8.2	(57)
75	8.9	(100)	6.9	(78)	4.6	(52)
Females						
0	78.3	(100)	71.7	(92)	62.8	(80)
15	64.5	(100)	58.1	(90)	49.4	(77)
25	54.8	(100)	48.7	(89)	40.4	(74)
45	35.7	(100)	30.5	(85)	23.6	(66)
65	18.7	(100)	14.7	(79)	9.9	(53)
75	11.7	(100)	8.6	(74)	5.2	(44)
Total						
0	74.6	(100)	68.7	(92)	61.0	(82)
15	60.9	(100)	55.2	(91)	47.8	(78)
25	51.5	(100)	46.1	(90)	39.0	(76)
45	32.7	(100)	28.1	(86)	22.1	(68)
65	16.7	(100)	13.3	(80)	9.1	(54)
75	10.6	(100)	7.9	(75)	5.0	(47)

Source: From synthesis of data on mortality, institutionalization and non-institutionalized disability, as explained in Chapter Four.

Notes:

a. All states of health together

b. Weighting factors used were as follows: INST = 0.4, CDMAJ = 0.5, RMAJ = 0.6, MINOR = 0.7, OSTD = 0.5, NODIS = 1.0.

c. Free of any health-related activity restriction (all categories of severity, institutionalized or not).

total life expectancy: 93 per cent for males and 92 per cent for females. In other respects, however, both the form and the severity of disability suffered differ substantially by sex.

Canadian women can expect to spend nearly twice as long as men resident in long-term care institutions (0.8 compared to 1.5 years). Females can also look forward to spending approximately 2.5 years longer than males with some degree of long-term disability not requiring institutionalization. Nevertheless, the 2.5 years tends to be with less severe limitation than that suffered by men, who can expect to spend over twice as long as women unable to carry out their major activity. The less severe categories of long-term activity limitation in the household population (RMAJ and MINOR), however, are more apt to be the lot of women, who can expect to spend four years more than men in these categories.

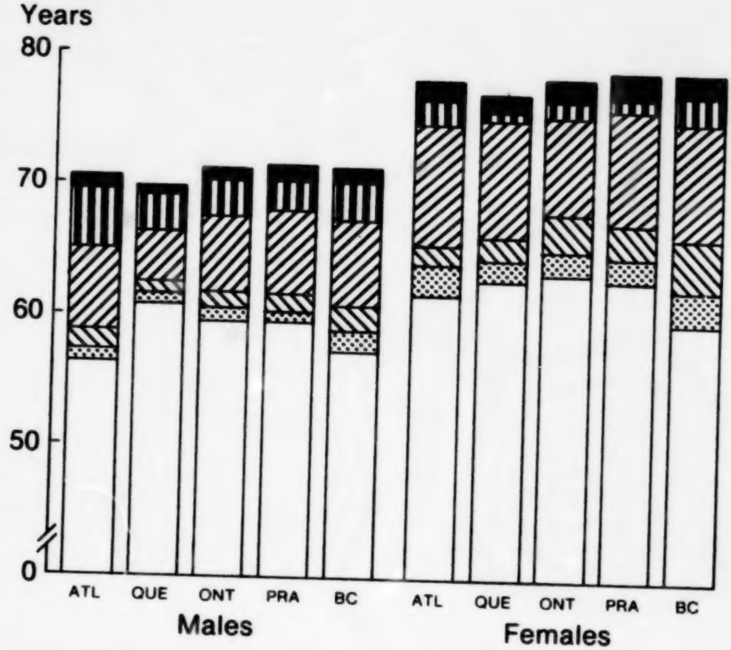
At age 65, Canadian men can expect to live, on average, another fourteen years, of which eight should be free of any health-related activity restriction. By comparison, Canadian women of that age can expect an average of nineteen more years of life, of which ten should be free of activity restriction. Thus for both sexes at age 65, 40 to 45 per cent of remaining life years will be impaired at least to some extent.

Although the details are not shown here, our calculations showed that nearly all of the expected years of impaired health at age 65 are in the form of chronic activity limitation, of which less than one fifth (12 and 20 per cent, respectively, for men and women) is institutionalized disability. Elderly Canadian women can expect to spend nearly twice as long as their male counterparts as residents of long-term care institutions (1.6 compared to 0.7 years), while the reverse is true of the most serious category of chronic disability in the household population (CDMAJ)—with which women can expect but eight months, compared to nearly two years for men. Altogether, then, both categories of severe long-term disability (INST plus CDMAJ) account for about 2.5 years of the remaining lifetime of both men and women in Canada at age 65.

In terms of quality-adjusted life, the expectation at age 65 is 11.6 years for men and 14.8 years for women—80 per cent of the remaining life years for both sexes. The disparity in life expectancy between the

Figure 5.2

Health Expectancy by Region, by Sex, Canada, 1978



Source: See Table 5.2.

■	**INST**	Institutionalized disability
▥	**CDMAJ**	Cannot do major activity
▨	**RMAJ**	Restricted in major activity
▧	**MINOR**	Minor activity restriction
░	**OSTD**	Only short-term disability
□	**NODIS**	Not restricted in activities (no disability)

TABLE 5.2

Health expectancy by region, by sex, Canada, 1978 (years at birth)

Sex/State of Health[a]	Atlantic	Quebec	Ontario	Prairies	B.C.	Canada
Males						
Long-term institutionalization	0.7	0.6	0.8	0.9	0.7	0.8
Cannot do major activity	4.9	3.1	2.8	2.2	3.2	3.0
Restricted in major activity	6.0	3.8	5.7	6.3	6.4	5.4
Minor activity restriction	1.2	0.9	1.4	1.4	2.3	1.3
Only short-term disability	1.0	0.8	1.1	1.2	1.5	1.1
Not restricted in activities	56.7	60.4	59.5	59.4	57.4	59.2
Total life expectancy	70.5	69.7	71.2	71.5	71.5	70.8
Quality-adjusted life[b]	64.4	65.5	66.1	66.3	65.5	65.8
Females						
Long-term institutionalization	1.3	1.4	1.6	1.8	1.5	1.5
Cannot do major activity	2.0	0.8	1.3	1.0	2.0	1.3
Restricted in major activity	9.4	9.3	7.8	9.1	9.3	8.7
Minor activity restriction	1.6	1.6	2.4	2.1	3.9	2.2
Only short-term disability	2.2	1.4	1.7	1.9	2.4	1.8
Not restricted in activities	61.8	63.1	63.7	63.0	59.8	62.8
Total life expectancy	78.3	77.6	78.4	78.9	78.9	78.3
Quality-adjusted life[b]	71.2	71.5	72.1	72.1	70.9	71.7

TABLE 5.2 (continued)

Sex/State of Health[a]	Atlantic	Quebec	Ontario	Prairies	B.C.	Canada
Total						
Long-term institutionalization	1.0	1.0	1.2	1.4	1.1	1.1
Cannot do major activity	3.5	2.0	2.0	1.6	2.6	2.1
Restricted in major activity	7.7	6.6	6.7	7.7	7.8	7.1
Minor activity restriction	1.4	1.2	1.9	1.8	3.1	1.8
Only short-term disability	1.6	1.1	1.4	1.6	2.0	1.4
Not restricted in activities	59.2	61.8	61.6	61.2	58.6	61.0
Total life expectancy	74.4	73.6	74.8	75.2	75.2	74.6
Quality-adjusted life[b]	67.8	68.5	69.1	69.2	68.2	68.7

Source: From synthesis of data on mortality, long-term institutionalization and non-institutionalized disability, as explained in Chapter Four.

Notes: a. See Chapter Four for definitions.

b. Weighting factors used were as follows: INST = 0.4, CDMAJ = 0.5, RMAJ = 0.6, MINOR = 0.7, OSTD = 0.5, NODIS = 1.0.

sexes at age 65 is 4.3 years for total remaining life years expectancy, 1.9 years for life free of any disability, and 3.3 years for quality-adjusted life.

Health Expectancy by Region

For all states of health combined, life expectancy at birth for both sexes is highest in British Columbia and the Prairies, followed closely by Ontario, and then by the Atlantic region and Quebec. These results are shown in Figure 5.2 and Table 5.2.

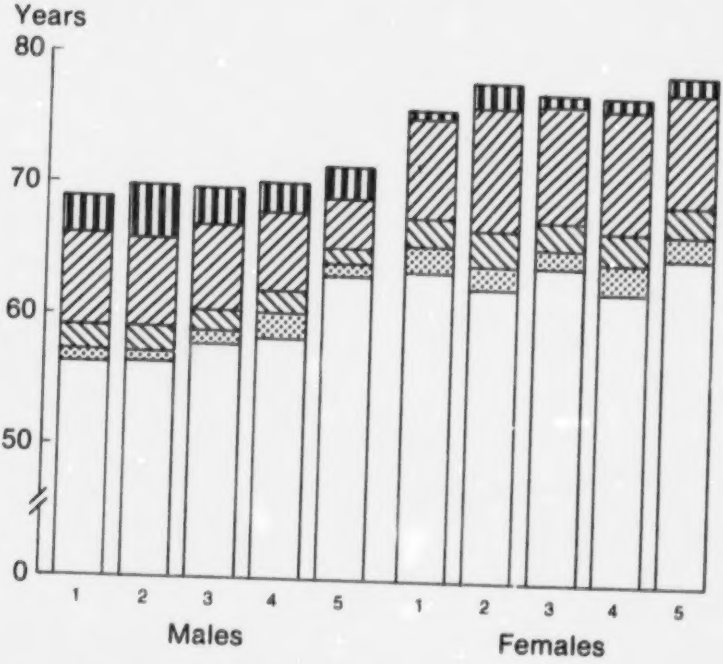
In terms of the average number of expected years of life free of any activity restriction, however, the ranking of regions changes quite considerably, with the relative positions of Quebec and British Columbia being most substantially affected. From a position of tied for best region in terms of total life expectancy for both sexes, British Columbia falls to last place for women and next-to-last place for men in terms of disability-free life. At the same time, Quebec rises from last position for both sexes in terms of overall expectation of life, to first for men and second for women in terms of disability-free life.

Quality-adjusted life expectancy, however, is a closer approximation to what we mean by healthfulness than is either life expectancy in all states or life expectancy completely free of activity restriction. In terms of this indicator, the healthiest regions of Canada are the Prairies, which combine long life with only moderate amounts of disability, and Ontario, which combines fairly long life with little disability. Third and fourth places in terms of quality-adjusted life expectancy go to Quebec and British Columbia, respectively. Quebecers have the shortest overall life expectancy, but the least reported disability,[1] while British Columbians have a longer life expectancy, but considerably more disability than other Canadians. The Atlantic provinces rank lowest among Canadian regions in terms of quality-adjusted life expectancy, due to lower-than-average life expectancy combined with higher-than-average disability.

Thus, even our very simple and rather arbitrary weighting of health states produces summary indicators that are intuitively reasonable. The results in terms of quality-adjusted life expectancy agree well with common-sense notions of what we mean by health. The

Figure 5.3

Health Expectancy by Community Size, by Sex, Canada, Late 1970s



Notes: Community-size group populations are as follows:

1. Under 1000
2. 1000-9999
3. 10 000-99 999
4. 100 000-999 999
5. 1 000 000 and over.

Source: See Table 5.3.

TABLE 5.3

Health expectancy by community size, by sex, Canada, late 1970s[a] (years at birth)

Sex/Community Size	CDMAJ	RMAJ	MINOR	OSTD	NODIS	ESALL[b]	QAL[b]
Males							
Less than 1 000 and rural	3.0	6.8	1.5	1.2	56.6	69.1	63.8
1 000-9 999	4.2	6.4	1.7	1.0	56.7	69.9	64.3
10 000-99 999	3.5	6.0	1.1	0.8	58.4	69.8	64.9
100 000-999 999	2.3	6.1	1.4	1.1	59.1	70.1	65.5
1 000 000 and over	2.8	3.7	1.2	1.2	62.8	71.8	67.9
Total	3.0	5.4	1.3	1.1	59.3	70.2	65.6
Females							
Less than 1 000 and rural	0.6	7.8	2.0	2.0	63.6	76.0	71.0
1 000-9 999	1.7	9.8	2.6	1.8	62.2	78.1	71.6
10 000-99 000	1.2	9.1	1.9	1.6	64.1	77.8	72.2
100 000-999 999	1.4	9.6	2.4	2.2	62.1	77.7	71.3
1 000 000 and over	1.2	8.5	2.4	1.5	65.1	78.8	73.3
Total	1.3	8.9	2.2	1.8	63.2	77.5	71.7
Total							
Less than 1 000 and rural	1.8	7.3	1.7	1.6	60.1	72.5	67.4
1 000-9 999	2.9	8.1	2.2	1.4	59.4	74.0	68.0
10 000-99 999	2.4	7.6	1.5	1.2	61.2	73.8	68.6
100 000-999 999	1.8	7.8	1.9	1.7	60.6	73.9	68.4
1 000 000 and over	2.0	6.1	1.8	1.4	64.0	75.3	70.6
Total	2.2	7.2	1.8	1.4	61.3	73.8	68.6

TABLE 5.3 (continued)

Source: Calculated by the authors from vital statistics, census and Canada Health Survey data.

Note:

a. Based on death data for 1975-1977, population data for 1976, and disability data for 1978.

b. ESALL = life expectancy (all states of health); QAL = quality-adjusted life expectancy.

healthiest areas combine high life expectancy with low disability, while the least healthy areas combine low life expectancy with high disability. Intermediate rankings go to areas with low life expectancy partially compensated for by low disability, or to areas with high life expectancy obtained at the expense of high disability.

The effect of alternate weighting schemes on measured differences between regions should not be overlooked, however. Using our weights for the various states of health, the value in terms of quality-adjusted life expectancy of the shorter but healthier lifespan of Quebec males is virtually identical to that of the longer but less healthy lifespan of British Columbia males. Assigning higher values to the disabled states, particularly the less severe categories (MINOR and OSTD), would tend to tip the scales in favour of British Columbia, while assigning lower values to the disabled states would tend to tip the scales in favour of Quebec. In other words, determination of the relative healthfulness of two areas depends partly on individual preferences. It is not possible to say unambiguously which area (or person) is better off without previously specifying the extent to which quality is to be traded off for quantity (or vice versa). Clearly, a long and healthy life is better than a shorter, less healthy one. But the relative value of each of the various states of health is still an open question.

Health Expectancy by Community Size

Figure 5.3 and Table 5.3 show the relationship of health expectancy to community size. For each sex, health expectancy is clearly higher in the largest urban areas (Montreal, Toronto and Vancouver) than elsewhere in Canada. This is true whether the indicator considered is overall life expectancy, disability-free life expectancy, or quality-adjusted life expectancy. Differences in health expectancy among the other size groups excluding the three largest cities are less pronounced, and depend to some extent upon which indicator is considered. For quality-adjusted life expectancy, however, which is the best single indicator of population health status, the pattern is one of progressively increasing healthfulness as community size increases. For both sexes together, quality-adjusted life expectancy is 67.4 in rural areas, 68.0 in towns of one to ten thousand persons, about 68.5 in other urban areas up to one million population, and 70.6 in our largest cities.

This pattern of variation in health expectancy by community size is probably due to a number of factors such as the income, education and occupation of residents, differing levels of services available, and a tendency to self-selection of populations by migration among the areas. An examination of community-size differences in causes of death, and in the severity and causes of disability, while beyond the scope of this report, would be most useful in helping to sort out the relative importance of the various factors underlying these findings. Such information could then be used in attempting to reduce the observed disparities that are clearly unfavourable to residents of smaller communities and rural areas.

Health Expectancy by Income

> Indicators of social class such as education and income reflect important differences in health status, not merely in terms of overall prevalence of problems but, more importantly, with respect to the types of problems resulting in serious consequences. It is clear that people in lower-income groups and with lower levels of education do not enjoy the same level of health as those Canadians of higher social and economic status.
>
> Canada Health Survey (1981, p. 114)

This section describes the data sources, methods and findings of our analysis of health expectancy by income. Our results show that healthfulness of life is directly related to income. Whether the measure is overall life expectancy, disability-free life, or quality-adjusted life expectancy, the pattern is similar: the poorer you are, the less healthy you are likely to be, over a shorter lifetime. Clearly, income-related disparities in health status are compounded, rather than diminished, when disablity is taken into account as well as overall life years.

Despite a general recognition of the importance of the link between socio-economic class and health status, and despite the availability of at least some information on socio-economic disparities in both mortality and morbidity,[2] the combined effects of income-related differences on both length of life and quality of health have not previously been calculated.

While 1978 data on disability by income are now available from the Canada Health Survey,[3] an analysis in terms of health expectancy also requires data on socio-economic differences in mortality. In this regard, apart from purely local studies (such as those by Loslier, 1976, and Wilkins, 1980b), the only such analysis for Canada generally is the study by Wigle and Mao (1980) reported in Chapter One, which applies to metropolitan Canada in 1971.

If it is to be done at all, then, calculation of health expectancy by income in 1978 must be based on 1971 mortality data for urban areas only. The combined index that results from this analysis will therefore be but a rough approximation of actual income disparities in health status.

The first step in our analysis was devised to take into account the increase in life expectancy in Canada over the period from 1971 to 1978. In order to estimate differences in life expectancy by income in 1978, the relative risk of dying for each income level in a particular age and sex group was assumed to have remained unchanged from 1971 to 1978.[4] The set of age- and sex-specific mortality rates for each quintile in 1978 was then obtained by multiplying the relative rates observed in 1971 by the absolute rates calculated for 1978.[5] Next, life tables for 1978 were calculated for each income group, based on the estimated mortality rates previously obtained. The results, while somewhat crude, are none the less the "best available" estimates we have of life expectancy by income in 1978. Finally, health expectancy by income was calculated, by applying the 1978 rates of disability in the household population (comprehensive data on institutionalization by income were not available[6]) to the estimated 1978 life table values by income.

Because of important methodological differences between the mortality and morbidity data sources, caution should be exercised when interpreting the results of our combined analysis. For one thing, we do not really know whether disparities in mortality remained constant between 1971 and 1978. If they actually increased or decreased over those years, our estimated disparities in health expectancy would necessarily be either too high or too low. In addition, the manner in which income level was determined was not the same in the two sources, although this is presumed to have the effect of reducing, rather than increasing, apparent disparities.

The results of our analyses of income-related differences in healthfulness of life are shown in Table 5.4. In terms of life expectancy at birth, the estimated disparity between the wealthiest 20 per cent of the population (fifth quintile) and the poorest'20 per cent (first quintile) is approximately 6.0 years for men and 3.0 years for women. By comparison, the 1978 disparity in life expectancy among regions is but 1.9 years for males, and 1.3 for females.

Taking into consideration degree of health enjoyed as well as overall length of life, we see that Canadian males from the highest income group can expect an additional fourteen years of life free of activity restriction, or eleven more years of quality-adjusted life compared to Canadian males from the lowest income group. For wealthier females, the corresponding advantages are an additional eight years of life free of activity restriction, or six more years of quality-adjusted life.

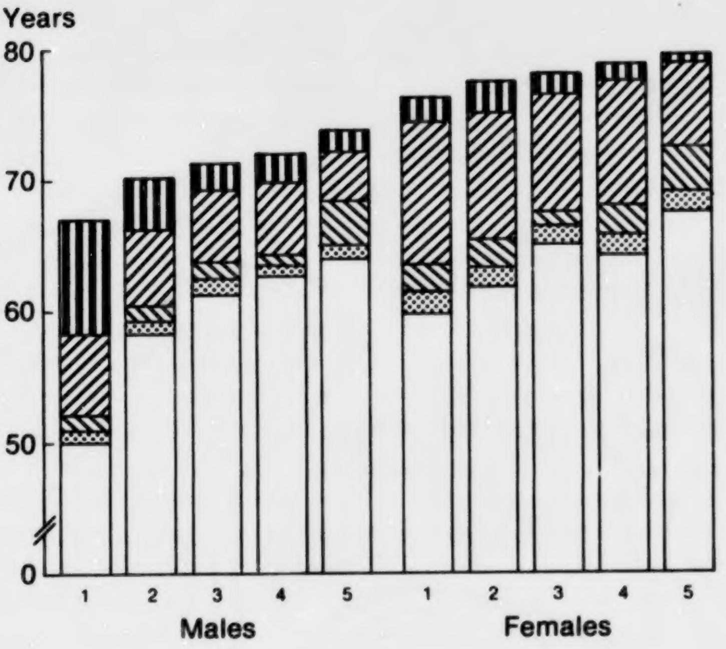
In spite of their shorter life, low-income males must endure almost twice the number of years of disability, and low-income females, an additional 40 per cent, compared to their high-income counterparts. (The disability figures cited here exclude long-term institutionalization, for which data cross-classified by income were not available.)

Even at age 65, the disparity between males of the highest and lowest income levels is 2.0 years of remaining life expectancy in all states of health, 3.0 years of quality-adjusted life, and 4.0 years of disability-free life. For females, the disparity is 0.4 years for all states of health, 1.4 years for quality-adjusted life, and 2.0 years for disability-free life. In each case, the advantage is in favour of the highest income group. (See Annex Table 5.3.)

Obviously, between rich and poor in Canada, there is no trade-off between life expectancy and activity restriction. A shorter life is not compensated for by less disability. Rather than cancelling each other

Figure 5.4

Health Expectancy by Income Level, by Sex, Canada, 1978



Notes: Income levels are as follows:

1. Lowest quintile
2. Second quintile
3. Third quintile
4. Fourth quintile
5. Highest quintile

■	**INST**	Institutionalized disability
▥	**CDMAJ**	Cannot do major activity
▨	**RMAJ**	Restricted in major activity
▧	**MINOR**	Minor activity restriction
▩	**OSTD**	Only short-term disability
□	**NODIS**	Not restricted in activities (no disability)

Source: See Table 5.4

out, the differences on one scale are added to those of the other, thus aggravating rather than reducing the disparities already observed.

Health Expectancy by Local Area

The distribution of health expectancy has been presented by age and sex, region, community size and income. Health services, however, are administered by provincial authorities, who typically delegate much of their responsibility for population health status to sub-provincial or local administrative units (such as local boards of health in Ontario, departments of community health in Quebec, and regional health districts in British Columbia). Unfortunately, the sample size used by the Canada Health Survey was not large enough to permit accurate estimates of disability in the household population for each province in the Atlantic and Prairie regions, nor of sub-provincial areas within the larger provinces.

If, in the future, national health surveys are repeated on a regular basis, the accumulation of data on disability over a period of two or three years would allow estimates of health expectancy to be made for all provinces as well as for major sub-provincial regions within the larger provinces. Still, health status in local areas is frequently quite different from provincial or regional averages. Specific surveys of local areas are the only way to determine how they compare to the larger units.

Local replications of parts of the Canada Health Survey have been carried out in Montreal, Ottawa and Saskatoon. Using special tabulations obtained from the Department of Community Health of the Montreal General Hospital, data on long-term disability from the Montreal replication (N = 1368) were used together with vital statistics for the local areas in order to calculate health expectancy by sex and district (Wilkins, 1982). As the Montreal survey was designed to sample the population of Local Community Service Centres from both the richest and poorest neighbourhoods of the city, the results are useful in describing the social dimension of health. In addition, even this one example of local use of the Canada Health Survey helps to underline the need for national and regional baseline data from larger surveys. It should be noted that long-term institutionalization could not be

TABLE 5.4

Health expectancy by income level, by sex, Canada 1978[a] (years at birth)

Sex/State of health[b]	Lowest	Second	Third	Fourth	Highest	Total
Males						
Cannot do major activity	8.8	4.1	2.1	1.9	1.2	3.3
Restricted in major activity	6.3	5.7	5.5	6.0	4.1	5.6
Minor activity restriction	1.0	1.2	1.1	0.7	2.5	1.3
Only short-term disability	0.9	1.1	1.2	0.8	1.3	1.1
Not restricted in activities	50.0	57.9	61.1	62.6	64.3	59.5
Total life expectancy	67.1	70.1	70.9	72.0	73.4	70.8
Quality-adjusted life[c]	59.4	64.8	66.8	68.1	69.7	66.0
Females						
Cannot do major activity	1.9	2.2	1.2	0.8	0.4	1.4
Restricted in major activity	11.0	9.7	9.5	9.9	6.4	9.2
Minor activity restriction	1.9	2.1	1.7	2.7	3.5	2.2
Only short-term disability	2.0	1.7	1.6	1.9	1.7	1.8
Not restricted in activities	59.9	61.8	64.3	63.5	67.5	63.6
Total life expectancy	76.6	77.6	78.5	79.0	79.4	78.3
Quality-adjusted life[c]	69.7	71.1	72.7	72.8	74.8	72.3
Total						
Cannot do major activity	5.4	3.2	1.7	1.3	0.8	2.3
Restricted in major activity	8.7	7.7	7.5	8.0	5.2	7.4
Minor activity restriction	1.5	1.7	1.4	1.8	3.0	1.8
Only short-term disability	1.4	1.4	1.4	1.3	1.5	1.5
Not restricted in activities	54.9	59.9	62.7	63.1	65.9	61.6
Total life expectancy	71.9	73.8	74.7	75.5	76.4	74.6
Quality-adjusted life[c]	64.6	68.0	69.8	70.5	72.3	69.2

TABLE 5.4 (Continued)

Source: From synthesis of data on mortality and non-institutionalized disability, as explained in Chapters Four and Five.

Notes:

a. Life expectancy values for 1978 estimated from 1971 data—see explanation in text.

b. See Chapter Four for definitions; data on long-term institutionalization not available by income.

c. Weighting factors used were as follows: CDMAJ = 0.5, RMAJ = 0.6, MINOR = 0.7, OSTD = 0.5, NODIS = 1.0.

TABLE 5.5

Health expectancy and social class indicators, by local area, Montreal, late 1970s[a]

Area	Life expectancy (years)	Disability-[b] free life (years)	Quality-[c] adjusted life (years)	Income[d] 1970 ($)	Professional[e] occupations (%)	Education[f] <9 years (%)	Population 1976 (N)
Westmount/NDG-Est	75.2	64.9	70.8	14 500	18.9	13.8	61 000
Montréal-Ouest/NDG-Ouest	74.5	67.0	71.4	10 300	13.0	20.9	50 000
Métro	71.8	60.5	67.3	10 400	12.7	15.1	36 000
St-Louis/Mile End	70.8	60.1	66.3	6 600	2.6	53.0	55 000
St-Henri/Petite Bourgogne	66.1	51.6	60.0	6 500	2.6	53.9	25 000
Total	72.6	62.0	68.1	10 200	10.8	28.3	227 000

Source: Health expectancy data from an analysis of census, vital statistics, and health survey data done by Russell Wilkins for the Department of Community Health, Montreal General Hospital, 1982. Social class data from Mongeau and Lescarbeault (1980), and Statistics Canada (1974c) and (1973d).

Notes:

a. Health expectancy figures based on population data for 1976, death data for 1975-76-77, and non-institutionalized disability data for 1979-80; data on long-term institutionalization not included in this analysis. Social class indicators based on data from 1971 and 1976 Census of Canada. Local areas refer to Local Community Service Centre districts of the Department of Community Health, Montreal General Hospital.

b. Free of any health-related activity restriction (long-term limitations only).

c. Weighting factors used were as follows: CDMAJ = 0.5, RMAJ = 0.6, MINOR = 0.7, OSTD = 0.5, NODIS = 1.0.

d. Average household income in 1970, including transfer payments.

e. Labour force engaged in managerial, administrative, teaching and related occupations (Occupation Major Groups 11 and 27) in 1971.

f. Compared to population 15 years of age and over.

considered in this analysis, due to a lack of suitable data.

Table 5.5 presents health expectancy and social class indicators for each health district covered by the Department of Community Health of the Montreal General Hospital. The disadvantaged Saint-Henri/Petite Bourgogne neighbourhood stands out in stark contrast to the more affluent Westmount/Notre-Dame-de-Grâce area. This is true not only in terms of the usual social class indicators (income, occupation and education), but also in terms of each of the measures of health expectancy.

The health disparity between these two areas is not less than nine years in terms of life expectancy at birth. None the less, the disparity in disability-free life is greater still: an average of thirteen years for both sexes. In terms of quality-adjusted life expectancy, the disparity is nearly eleven years.

Although not shown here, the Montreal replication of the Canada Health Survey also included a series of questions relating to ability to perform the usual activities of daily living (such as getting up, dressing, eating, bathing, using the toilet, moving about and going outside). These questions were asked of all persons previously determined (in Section V of the Interviewer Administered Questionnaire) to have any degree of limitation in normal activities. In addition to being more "culture free" for comparative purposes, responses to this type of question can more easily be related to possible unmet needs for services. Preliminary analysis of these results indicates that nearly half of all persons having any activity restriction were, in fact, limited to some extent in the basic activities of daily living. Moreover, while men were more apt than women to be severely disabled in terms of not being able to do their major activity, females were more likely than males to be severely disabled in terms of inability to carry out the usual activities of daily living.

Notes

1. In all categories of short-term disability in the household population (bed-days, major activity loss days and total short-term disability days), Quebec males have by far the lowest rates of

Canada's five regions. Quebec males also post much lower-than-average rates of long-term disability, (categories CDMAJ, RMAJ, MINOR). As Quebec females rank much closer to the Canadian average, these differences cannot be due to perceived differences in the meaning of the French version of the interview questions.

2. In the Canada Health Survey, the lowest category of educational attainment was "some secondary or less." As the bulk of disability occurs in the older age groups in which higher levels of educational attainment are uncommon, little scope is left for the examination of the links between disability and education. In the population aged 15 and over not currently attending school full time, 46 per cent of all persons fall into the lowest category of educational attainment used in recording survey responses. At ages 45-64, the corresponding figure is 62 per cent, and at ages 65 and over, it is 74 per cent of the population.

3. In the Canada Health Survey results, each person was assigned to an income quintile based on total family income, number of persons in the family, and the size of the community of residence. In this way, the amount of family income required for inclusion in a given income quintile was higher for large families living in big cities than it was for small families in rural areas or small towns. While more complex than a single set of income cut-off lines for the entire country, this method of assigning persons to quintiles is more reflective both of income adequacy in relation to need (family size) and of relative wealth or poverty within a community.

4. As social disparities in mortality have been observed to remain remarkably constant over time in several countries, this assumption is not completely unwarranted. It should be noted, however, that the assumption of unchanging relative mortality rates combined with decreasing absolute rates (as in the case here) results in a somewhat diminished disparity in terms of life expectancy. Thus our seemingly static assumption actually

implies a slightly decreased disparity in terms of life expectancy, rather than no change.

5. The 1971 ratios of mortality in a given income group compared to mortality in all income groups taken together were first calculated. In moving from the first and lowest income quintile to the fifth and highest quintile, a clear trend of decrease is apparent in the mortality of most age groups of both sexes. Not surprisingly, since household income is largely determined by the male bread-winner, the effect of income on mortality appears to be stronger for males than females. Nevertheless, the effect of even modest differences is quite substantial when cumulated over the course of an entire lifetime.

6. Ontario data on income-related differences in hospitalization were analysed recently by Barer et al. (1982). Their results showed a greater usage of hospital facilities by low-income groups compared to high-income groups. However, the data excluded special-care facilities, where the bulk of long-term care is concentrated.

Chapter Six

TRENDS IN HEALTH EXPECTANCY AND PROJECTIONS OF ACTIVITY RESTRICTION

> Within a reference framework where mortality is one of the main indicators of health, there is a general feeling of optimism about the impact of the health care system, since overall mortality indices have been improving constantly over the past few decades. However, no one contends that "health" can be assessed in terms of death alone. It is not enough to know that life expectancy is rising or remaining stable; the individual's ability to function must be preserved or, better yet, improved.
>
> Colvez and Blanchet (1981, p. 464)

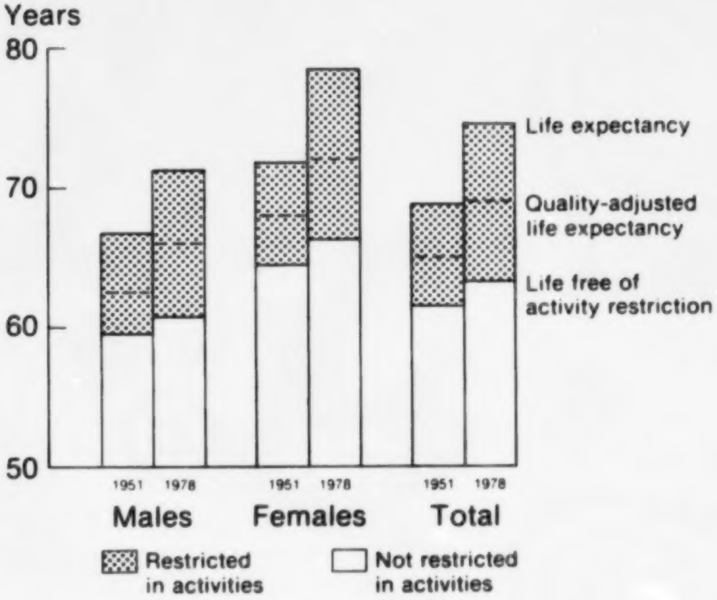
Changes in Health Expectancy from 1951 to 1978

Knowledge of changes over time in health expectancy is fundamental to any evaluation of social progress or decline. Unfortunately, while data on length of life are collected regularly, data on the qualitative aspects of health are not. Prior to the Canada Health Survey of 1978-79, the Canadian Sickness Survey of 1950-51 is our only source of data on the health and disability status of the population as a whole.[1]

Conceptual and methodological differences between the two surveys limit the types of comparisons that can be made and raise questions as to the meaning of apparent differences between some of the findings. However, the importance of knowing, if possible, whether healthfulness increased or decreased as life expectancy rose from 1951 to 1978 is sufficient to justify at least attempting to make such

Figure 6.1

Health Expectancy at Birth, by Sex, Canada, 1951 and 1978



Source: See Table 6.1.

TABLE 6.1

Health expectancy at birth, by sex, Canada, 1951 and 1978 (years)

Health Expectancy	Males	Females	Total
Life expectancy[a]			
1951	66.3	70.8	68.6
1978	70.8	78.3	74.6
Change: 1951-1978	+4.5	+7.5	+6.0
Disability expectancy[b]			
1951	6.6	6.1	6.3
1978	9.7	12.2	11.0
Change: 1951-1978	+3.2	+6.1	+4.7
Disability-free life expectancy[c]			
1951	59.8	64.7	62.2
1978	61.1	66.1	63.6
Change: 1951-1978	+1.3	+1.4	+1.3
Quality-adjusted life expectancy[d]			
1951	63.1	67.8	65.4
1978	66.0	72.2	69.1
Change: 1951-1978	+2.9	+4.4	+3.7

Notes:
a. All states of health combined.
b. Long-term disability or activity limitation, excluding institutionalization and purely short-term disability.
c. Life expectancy less disability expectancy.
d. Disability expectancy counted as 50 per cent of disability-free life expectancy.

comparisons where this may be possible and warranted.

By applying the 1951 age- and sex-specific rates of long-term disability shown in Table 3.3 to the expected life years shown in the 1951 Canadian life tables (Dominion Bureau of Statistics, 1960a), the expected number of years of activity restriction (disability) and of life free of activity restriction (disability-free life) were calculated for 1951. As comprehensive 1951 data on institutionalization were lacking, the disability expectations resulting from these calculations refer only to the experience of the non-institutionalized population. Also lacking for 1951 were data on short-term disability for persons not reporting any long-term activity limitation.[2] This means that, for 1951, only long-term disability of persons not living in institutions could be considered. For 1978, then, only the same categories of disability are shown, in order to facilitate comparisons between the two years.

Figure 6.1 and Table 6.1 show health expectancy at birth, by sex, for Canada in 1951 and 1978. In both years, institutionalized disability as well as purely short-term disability are excluded. Although life expectancy rose by 4.5 years for males and 7.5 years for females, expected years of disability-free life rose by but 1.3 and 1.4 years, for males and females respectively. When quality-adjusted life expectancy is calculated, counting two years of activity limitation as the equivalent of one year of life free of activity limitation, the gains from 1951 to 1978 are over twice what they were when only disability-free life was considered. Quality-adjusted life expectancy increased 3.2 years for men, and 6.1 years for women. While that is considerably less than the improvement in life expectancy in all states of health, it none the less represents an appreciable net gain in terms of healthfulness.

Are Canadians healthier now than in the past? For Canada as a whole, from 1951 to 1978, average length of life increased substantially, but the prevalence of activity restriction in the population also increased. On balance, however, even after discounting gains due to increased disability, it still appears that real progress has indeed been made. In terms of quality-adjusted life expectancy, males in 1970 had an additional three years, and females, an additional six years, compared to 1951.

But what about more recent trends? Over the last ten or fifteen years, since the introduction of universal medical and hospital insurance, what has happened to health expectancy? The answer is that we simply do not know, nor can we know, since the basic data on disability in the household population were never collected. As far as trends since 1978 are concerned, these will also be impossible to determine, unless surveys of population health status are repeated at regular intervals.

Comparison with Sullivan's Findings for the United States, Mid-1960s

Compared to Sullivan's (1971a) findings for the United States, Canadians of both sexes in 1978 not only lived longer, but were in better health than their American counterparts of the mid-1960s. By 1978, overall life expectancy in Canada was 4.0 years greater for males, and 4.6 years greater for females than it was for Americans in the mid-1960s. In addition, the expected number of years of severe disability for both sexes was noticeably lower in Canada in 1978 than it was in the United States over twenty years before (4.9 compared to 5.2 years for men, and 4.6 compared to 5.3 years for women, in Canada and the United States, respectively).

As we know that activity restriction in the United States population has significantly increased since the mid-1960s (Colvez and Blanchet, 1981), the differences between Canada and the United States in life years with and without disability should be even greater at present, were it possible to repeat Sullivan's calculations using more recent data.[3] Indeed it is likely that Canadians now experience fewer years of disability than their American counterparts. In two countries that are otherwise similar in many respects, such differences, if they prove to be real, would warrant further study in order to determine the probable explanatory factors underlying these differences.

Projections of Activity Restriction

In the years ahead, the problem of what to do about rising amounts of chronic health impairment in the population will increasingly demand the attention of policy makers. Until recently, little emphasis was given to this frequently overlooked—and in the absence of population health surveys, largely invisible—dimension of health. The International Year of the Disabled and the report of the Canada Health Survey helped raise the general level of awareness of these problems. But Canada's population is aging rapidly due to increased longevity and continued low fertility, meaning that the sheer bulk of these problems is likely to become much greater still in the future.

At present, 35 per cent of all hospital beds and 75 per cent of beds in all categories of health-care institutions are devoted to long-term care, most of which is for elderly persons with chronic health problems. In addition, 25 per cent of all long-term disability in the household population is accounted for by persons 65 years of age and over, although this group makes up but 12 per cent of the household population. Because chronic disability is so much more likely to occur among the elderly, any increase in the size of this age group increases the total amount of disability far more than might be expected based on population alone.

In Prognosis for Hospitals, Lefebvre et al. (1979) demonstrated that the aging of the Canadian population has profound implications for the utilization of health-care facilities. Our projections, discussed below, indicate that the changing age structure of the population can also be expected to result in very significant increases in the prevalence of disability in the total population. This is true even assuming no increase in the likelihood of disability at each age.

By applying 1978 age- and sex-specific rates of disability—including both institutionalized and non-institutionalized forms of activity restriction—to the projected population of each age group and sex, we can determine the effects of Canada's changing population structure on the total volume of disability that can be expected in the future.[4]

It should be emphasized that this exercise is in no way a prediction, for the method simply assumes that age-specific rates of disability will not change in the years ahead. If recent experience in the United States is any guide, that assumption is most unlikely to be borne out, and it is thus apt to result in substantial underestimation of future volumes of disability.

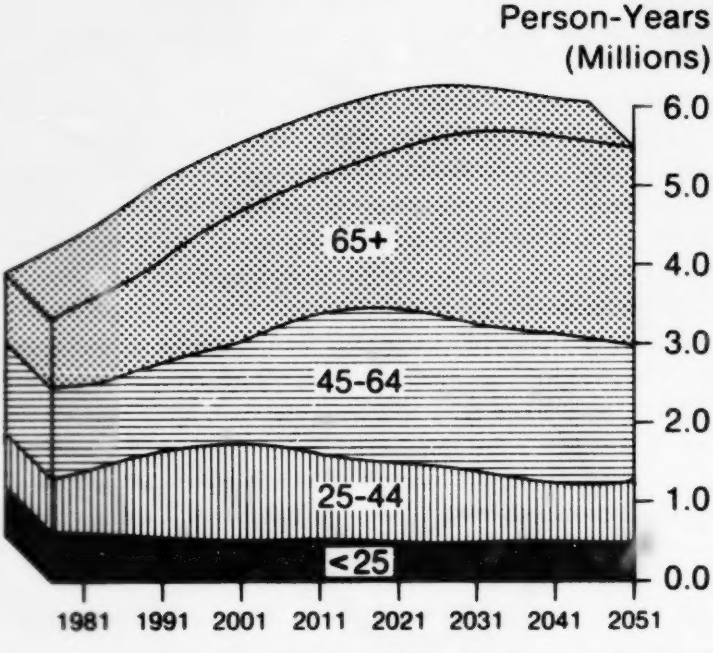
Nevertheless, even assuming no increase in the rates at each age, the total volume of disability in Canada is projected to increase greatly over the next fifty years as the post-war baby-boom generation moves into old age.

Figure 6.2 and Table 6.2 show the effects of projected demographic changes on the total volume of activity restriction in Canada from 1978 to 2051. For purposes of this projection, the 1978 rates of disability by sex in each age group were assumed to remain constant over the entire period. This means that all of the projected increase in activity restriction is due to changes in population size and structure rather than to any changes that may occur in health status. Under these conditions, the total volume of activity restriction in Canada is projected to increase by 50 per cent by the year 2031. Until about 2011, the increase is attributable to persons aged 45-64 as well as to persons aged 65 and over. After that time, however, essentially all of the increase is due to rapid growth in the number of persons aged 65 and over. This is another of the delayed effects of the post-war baby boom in Canada.

Table 6.3 shows the projected increase in activity restriction in each of the five severity categories. The percentage of population institutionalized for purposes of health care would, under the assumption of constant rates of disability at each age, nearly double over the next fifty years. Because of the high public expenditures and manpower requirements of institutional care, it is not hard to foresee needs for careful planning as well as for better organization and financing in this area. Over the same period, the percentage of population not institutionalized but unable to do or restricted in their major activity would increase by half. Because the absolute numbers involved here are so high, one cannot help but wonder how the implied increase in need for homecare services will be able to be handled. Already, the inadequacy of such services compared to existing demand is frequently criticized. The only categories of activity restriction for which low or negative growth is projected are the two least severe categories. The percentage of persons suffering minor activity restrictions would increase only marginally, while that of persons with purely short-term disability would actually decline somewhat.

Figure 6.2

Projected Total Volume of Activity Restriction, Canada, 1978 - 2051



Note: Assuming no change in 1978 rates by sex in each age group

Source: See Table 6.2

TABLE 6.2

Total volume of activity restriction,[a] by age and sex, Canada, 1978,[b] and projections from 1991 to 2051[c] (in thousands)

Sex/Year	0-14	15-24	25-44	45-64	65+	All Ages	Population	Rate (%)[d]
Males								
1978	160	157	296	508	395	1 517	11 671	13.0
1991	164	132	417	588	518	1 819	13 336	13.6
2001	157	139	411	770	585	2 062	14 185	14.5
2011	147	138	384	973	668	2 310	14 769	15.6
2021	149	126	391	951	880	2 496	15 097	16.5
2031	142	128	373	895	1 078	2 616	15 030	17.4
2041	138	124	361	910	1 036	2 569	14 731	17.4
2051	136	119	358	866	1 022	2 502	14 369	17.4
Females								
1978	118	171	422	553	557	1 821	11 805	15.4
1991	119	141	588	632	812	2 292	13 638	16.8
2001	115	149	571	835	946	2 615	14 608	17.9
2011	108	147	531	1 050	1 077	2 913	15 299	19.0
2021	108	134	541	1 016	1 395	3 194	15 779	20.2
2031	104	137	515	949	1 709	3 415	15 905	21.5
2041	101	132	499	966	1 700	3 398	15 699	21.6
2051	100	127	495	921	1 667	3 309	15 305	21.6

TABLE 6.2 (continued)

Sex/Year	0-14	15-24	25-44	45-64	65+	All Ages	Population	Rate (%)[d]
Total								
1978	277	328	718	1 062	951	3 337	23 476	14.2
1991	284	273	1 004	1 220	1 330	4 112	26 975	15.2
2001	272	289	981	1 604	1 530	4 676	28 793	16.2
2011	255	285	915	2 023	1 745	5 223	30 068	17.4
2021	257	260	932	1 967	2 274	5 691	30 877	18.4
2031	246	266	888	1 844	2 788	6 031	30 935	19.5
2041	239	255	861	1 877	2 736	5 968	30 430	19.6
2051	236	246	853	1 787	2 690	5 811	29 674	19.6

Source: Disability rates for 1978 from Table 4.1. Population projections to 2026 from Statistics Canada (1979d). Population projections from 2026 to 2056 from unpublished tables provided by the Populations Projections and Estimates Section, Census Division, Statistics Canada, 1979.

Notes:

a. Including institutionalized and non-institutionalized disability, all degrees of severity, short term as well as long term. See Chapter Four for details.

b. Exact dates vary depending on type of disability.

c. Based on 1978 age- and sex-specific rates applied to the population structures shown in Statistics Canada Projection No. 3.

d. Total volume of disability divided by total population.

TABLE 6.3

Total volume of activity restriction, by type of restriction, by sex, Canada, 1978, and projections from 1991 to 2051[a] (percentage of population)

Sex/Year	INST	CDMAJ	RMAJ	MINOR	OSTD	TVD	POP (x 1 000)
Males							
1978	0.7	3.0	5.9	1.8	1.6	13.0	11 671
1991	0.8	3.2	6.3	1.8	1.5	13.6	13 336
2001	0.8	3.6	6.7	1.9	1.5	14.5	14 185
2011	0.9	4.1	7.2	1.9	1.5	15.6	14 769
2021	1.0	4.4	7.7	1.9	1.5	16.5	15 097
2031	1.2	4.7	8.2	1.9	1.5	17.4	15 030
2041	1.2	4.7	8.2	1.9	1.5	17.4	14 731
2051	1.2	4.7	8.2	1.9	1.5	17.4	14 369
Females							
1978	1.1	1.1	8.3	2.5	2.3	15.4	11 805
1991	1.3	1.3	9.2	2.7	2.4	16.8	13 638
2001	1.4	1.4	9.9	2.8	2.3	17.9	14 608
2011	1.6	1.6	10.7	2.9	2.3	19.0	15 299
2021	1.9	1.7	11.5	2.9	2.3	20.2	15 779
2031	2.2	1.8	12.2	3.0	2.2	21.5	15 905
2041	2.2	1.8	12.3	3.0	2.2	21.6	15 699
2051	2.2	1.8	12.3	3.0	2.2	21.6	15 305

TABLE 6.3 (continued)

Sex/Year	INST	CDMAJ	RMAJ	MINOR	OSTD	TVD	POP (x 1 000)
Total							
1978	0.9	2.1	7.1	2.2	2.0	14.2	23 476
1991	1.0	2.2	7.8	2.2	2.0	15.2	26 975
2001	1.1	2.5	8.3	2.3	1.9	16.2	28 793
2011	1.2	2.8	9.0	2.4	1.9	17.4	30 068
2021	1.5	3.0	9.6	2.4	1.9	18.4	30 877
2031	1.7	3.2	10.2	2.5	1.9	19.5	30 935
2041	1.7	3.2	10.3	2.5	1.9	19.6	30 429
2051	1.7	3.2	10.3	2.5	1.9	19.6	29 674

Source: See Table 6.2.

Note: a. Column headings are abbreviated as follows: INST = Long-term institutionalization (including hospitals, mental hospitals and special-care facilities); CDMAJ = cannot do major activity; RMAJ = restricted in major activity; MINOR = minor activity restriction; OSTD = only short-term disability; TVD = total volume of disability; POP = population.

Notes

1. In this regard, see Note 2 to the Introduction.

2. Since short-term disability among persons reporting no long-term disability (OSTD) is mostly due to colds, flus and minor accidents, it is probably not unreasonable to assume that these rates remained fairly stable over the twenty-seven years separating the two surveys. In the total population (including persons with chronic disability), the annual number of bed disability days and of total short-term disability days increased only slightly from 1951 to 1978. In any case, purely temporary disability accounts for only a relatively small portion of the total volume of activity restriction in the population. On the other hand, we know very well that rates of long-term institutionalization have changed markedly over the years, at least for certain categories of such institutions.

3. While working in 1981 at the International Statistics Division of the United States National Center for Health Statistics, Australian National University demographer Leonard Smith attempted to replicate Sullivan's work on health expectancy using more recent data. We are unaware, however, whether or not this work has been completed and published.

4. For the projections shown in this chapter, the highest age group was taken as 65 and over. Had two or more age groups been used for these ages, the projected increase in activity limitation would have been greater still. In particular, institutionalized disability is highly concentrated at ages 75 and over, age groups that will in future form a larger proportion of the population aged 65 and over.

Chapter Seven

SUMMARY AND CONCLUSIONS

Summary

Functional Health Status

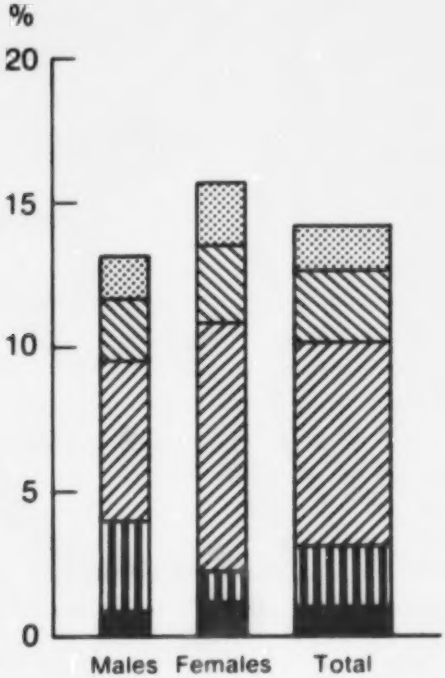
In 1978, over a quarter of a million Canadians were resident in long-term health-care institutions such as chronic care and mental hospitals, homes for the aged, and institutions for the mentally or physically handicapped. However, the number of totally or partially disabled persons in the non-institutionalized household population was several times greater. Nearly half a million were so severely disabled as to be chronically unable to work, attend school or keep house, while another 1.7 million were limited in the kind or amount of major activities that they were able to perform. In addition, half a million persons, although not usually limited in terms of work, school or housework, suffered health problems that restricted them in terms of other activities, and on an average day yet another half million were temporarily disabled by illness or accident.

The first column of Table 7.1 shows the number of Canadians who are institutionalized for purposes of health care, followed by the number not institutionalized but suffering various degrees of health-related activity restriction. Long-term limitations clearly form the vast majority of all activity restriction; about 13 per cent of the population suffers from such limitations at any time. (See Figure 7.1.)

By taking account of the age-sex distribution of activity restriction, as well as the chances of surviving to a given age, it is possible to summarize the three types of data related to population

Figure 7.1

Activity Restriction in the Total Population, by Sex, Canada, 1978



Source See Table 7 1

■	**INST**	Institutionalized disability
▥	**CDMAJ**	Cannot do major activity
▨	**RMAJ**	Restricted in major activity
▧	**MINOR**	Minor activity restriction
▩	**OSTD**	Only short-term disability
□	**NODIS**	Not restricted in activities (no disability)

TABLE 7.1

Functional health status of the population, and life expectancy at birth in each of the various states of health, Canada, 1978[a]

Category	Population (both sexes)		Health Expectancy[b]		
	N	%	M	F	T
Institutionalized disability	214 000	0.9	0.8	1.5	1.1
Long-stay hospital units	47 000	0.2	0.2	0.3	0.3
Mental hospitals[c]	11 000	0.0	0.1	0.0	0.1
Special-care facilities[d]	156 000	0.7	0.5	1.2	0.8
Non-institutionalized disability	3 124 000	13.2	10.8	14.0	12.5
Cannot do major activity	486 000	2.1	3.0	1.3	2.1
Restricted in major activity	1 670 000	7.1	5.4	8.7	7.1
Minor activity restriction	509 000	2.2	1.3	2.2	1.8
Only short-term disability	458 000	2.0	1.1	1.8	1.4
Disability-free[e]	20 346 000	85.8	59.2	62.8	61.0
Total	23 683 000	100.0	70.8	78.3	74.6

Notes:

a. For definitions and sources, see Chapters Two, Three and Four.

b. Years of life expectancy at birth in each of the various states of health.

c. Except short-stay hospitals.

d. Except self-sufficient residents.

e. Not restricted in activities due to health impairment.

health status—mortality, institutionalization and non-institutionalized disability—in terms of life expectancy in each state of health (health expectancy). These results are shown at the right side of the table. Years of activity restriction form a surprisingly large part of total life expectancy. The most severe categories of activity restriction (institutionalized or otherwise unable to do major activity) account for over three years of life expectancy at birth (3.8 years for men and 2.8 years for women).

Demographic, Regional and Social Dimensions of Health Expectancy

The distribution of health and disability within the population is very uneven. Figure 7.2 and Table 7.2 summarize the differences in health expectancy by age, region, community size, income level and local area.

The three indicators shown are overall life expectancy, life free of activity restriction (disability-free life), and a summary of the two, quality-adjusted life expectancy. Of the three, quality-adjusted life expectancy best summarizes health expectancy in terms of both quality and quantity.

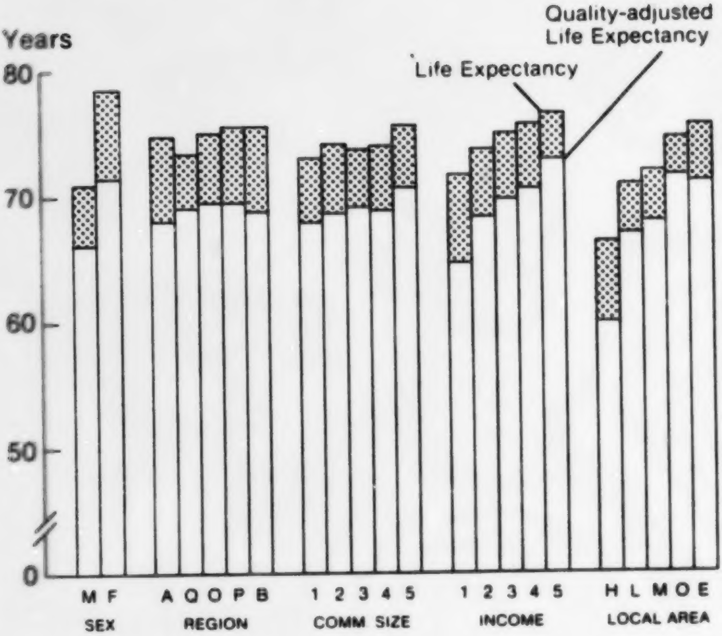
In terms of quality-adjusted life, Ontario and the Prairies, which combine high life expectancy with low or moderate rates of disability, are tied for first place among the regions. The Atlantic provinces, which combine low life expectancy with high rates of disability, are last among the regions.

Quality-adjusted life expectancy is lowest in rural areas (67.4 years), about a half-year greater than that in communities of one to ten thousand persons (68.0), another half-year greater in communities of ten thousand to one million population (68.5), and yet another two years higher in Canada's three largest cities (70.6).

A glance at the figures by income level makes it clear that the poorer you are, the more likely you are to die young. Not only that, but your shorter life is also more likely to be afflicted with serious health problems. Between the highest and lowest income levels, the disparity in overall life expectancy is 4.5 years. This disparity grows to 7.7 years after adjustment for the quality of those life years in terms of the expectation of disability. Where data are available, a similar pattern

Figure 7.2

Disparities in Health Expectancy, by Sex, Region, Community Size, Income Level and Local Area, Canada, Late 1970s



Source: See Table 7.2

Notes:

Regions — A = Atlantic provinces; Q = Quebec; O = Ontario; P = Prairie provinces; B = British Columbia.

Community-size groups — 1 = less than 1000 and rural; 2 = 1000-9999; 3 = 10 000-99 999; 4 = 100 000 -999 999; 5 = 1 000 000 and over.

Income levels — 1 = lowest quintile; 5 = highest quintile.

Local areas — H = Saint-Henri/Petite Bourgogne; L = Saint-Louis du Parc/Mile End; M = Metro; O = N.D.G.-Ouest/Montréal-Ouest; E = N.D.G.-Est/Westmount.

Table 7.2

Distribution of health expectancy in Canada, by sex, late 1970s (in years)

	Life Expectancy			Disability-Free Life			Quality-Adjusted Life		
	M	F	T	M	F	T	M	F	T
Age									
At birth	70.8	78.3	74.6	59.2	62.8	61.0	65.8	71.7	68.7
15 years	57.2	64.5	60.9	46.2	49.4	47.8	52.4	58.1	55.2
25 years	48.1	54.8	51.5	37.6	40.4	39.0	43.5	48.7	46.1
45 years	29.6	35.7	32.7	20.6	23.6	22.1	25.6	30.5	28.1
65 years	14.4	18.7	16.7	8.2	9.9	9.1	11.5	14.7	13.3
75 years	8.9	11.7	10.6	4.6	5.2	5.0	6.9	8.6	7.9
Region									
Atlantic	70.5	78.3	74.4	56.7	61.8	59.2	64.4	71.2	67.8
Quebec	69.7	77.6	73.6	60.4	63.1	61.8	65.5	71.5	68.5
Ontario	71.2	78.4	74.8	59.5	63.7	61.6	66.1	72.1	69.1
Prairies	71.5	78.9	75.2	59.4	63.0	61.2	66.3	72.1	69.2
British Columbia	71.5	78.9	75.2	57.4	59.8	58.6	65.5	70.9	68.2
Community Size									
Less than 1 000 and rural	69.1	76.0	72.5	56.6	63.6	60.1	63.8	71.0	67.4
1 000 - 9 999	69.9	78.1	74.0	56.7	62.2	59.4	64.3	71.6	68.0
10 000 - 99 999	69.8	77.8	73.8	58.4	64.1	61.2	64.9	72.2	68.6
100 000 - 999 999	70.1	77.7	73.9	59.1	62.1	60.6	65.5	71.3	68.4
1 000 000 and over	71.8	78.8	75.3	62.8	65.1	64.0	67.9	73.3	70.6
All size groups	70.2	77.5	73.8	59.3	63.2	61.3	65.6	71.7	68.6

Table 7.2 (continued)

	Life Expectancy			Disability-Free Life			Quality-Adjusted Life		
	M	F	T	M	F	T	M	F	T
Income Level									
Lowest	67.1	76.6	71.9	50.0	59.9	54.9	59.4	69.7	64.6
Second	70.1	77.6	73.8	57.9	61.8	59.9	64.8	71.1	68.0
Third	70.9	78.5	74.7	61.1	64.3	62.7	66.8	72.7	69.8
Fourth	72.0	79.0	75.5	62.6	63.5	63.1	68.1	72.8	70.5
Highest	73.4	79.4	76.4	64.3	67.5	65.9	69.7	74.8	72.3
Local Area									
Poor neighbourhood	61.4	70.9	66.1	49.2	54.0	51.6	56.1	63.9	60.0
Middle-class district	72.2	78.2	75.2	62.9	66.9	64.9	68.2	73.5	70.8

Note: See Chapter Five for details. Figures shown are for expectancy at birth, except where otherwise indicated.

can be seen among neighbourhoods at the local level.

Past Trends and Future Prospects

In so far as comparisons between the American and Canadian health surveys are possible, it appears that the current prevalence of disability in Canada is lower than that reported recently in the United States. This applies to all categories of household disability in most age groups of both sexes.

In Canada from 1951 to 1978, bed-days per person in the household population showed little or no change, while total short-term disability days remained stable for males, but increased for females. Non-institutionalized long-term activity limitation appears to have increased substantially at all ages for both sexes, but with particularly large increases for women. During the same thirty-year period, life expectancy at birth increased by 4.5 years for men, compared to 7.5 years for women. Thus at least part of the increase in overall length of life was apparently obtained at the expense of increased disability.

Because of the aging of the large post-war baby-boom generation, the amount of activity restriction in the Canadian population is projected to increase substantially in the future, even assuming no increase in the current age- and sex-specific rates of disability. This will have numerous implications for the organization and financing of health care and social services for the population.

According to Colvez and Blanchet (1981, p. 470), the systematic introduction of disability statistics in the planning process would have at least three main policy implications:

1. It would make incapacitating chronic illness (osteoarticular and neurological diseases) among the first priorities, which they are not at present.
2. It would refine policy objectives, which would then consist not only in lowering mortality but in improving the ability to function, which does not seem always to follow mortality reduction.
3. It would increase public awareness of the price that must sometimes be paid in disability in order to improve the mortality rate and vice versa; more specifically, it would reinforce efforts to see that certain technological innovations, in both diagnosis and therapy, do not

give rise to more harmful consequences than real advantages, particularly when the expected advantage itself is not obtained.

Recommendations

The following recommendations are based on our analysis of existing data and projections concerning health status as well as on a review of various proposals concerning health and social services programs in Canada. The recommendations are grouped under three headings, according to the intent of the actions proposed.

- The first set of recommendations concerns the formulation of explicit health and social services outcome objectives, based on the use of population health status indexes of the type illustrated in this study.
- The second set of recommendations concerns the setting up of a co-ordinated system of data collection and analysis to allow monitoring of progress towards the goals thus set out. Regular health surveys of the general population are essential in this regard.
- The third set of recommendations concerns support for related basic and applied research, especially that directed towards the prevention and treatment of chronic health impairments or functional disability.

Formulation of Explicit Goals and Outcome Objectives

In order to assess current status, monitor trends over time, and evaluate the success or failure of specific programs, it is necessary to formulate explicit goals and outcome objectives for health and social services, which should take into account the quality of life as well as its duration.

We take for granted that the principal objective of health and social services programs is to ensure optimal health and social functioning for all Canadians. This implies the utilization of available resources in the most efficient manner possible for the good of society as a whole. The problem is, of course, how to know when this laudable goal is, in fact, being accomplished.

Evaluation should be independent of the specific methods used to attain these ends. We recommend that the primary goal be to maximize the number of expected years of healthy life (health expectancy). Progress towards this goal could then be determined by reference to some sort of quality-adjusted life expectancy index, possibly along the lines suggested in Chapters Four and Five.

By explicitly valuing successful efforts to minimize functional disability as well as loss of life, the indicator would correspond closely to commonly perceived notions of health needs, and at the same time permit an objective assessment of success or failure in relation to those objectives. The "bottom line" for health planning would at last be expressed in terms of final outputs, rather than simply in terms of intermediate inputs (expenditures). The basis of a system of social acounting would have been laid, a pre-condition for maintaining or increasing the long-term efficiency and effectiveness of efforts aimed at improving the healthfulness of life.

National health objectives might be set as follows:

- Prevention of premature death and disability, including delaying the onset of chronic diseases as well as avoiding preventable disability and loss of life (primary prevention). This would require reducing avoidable risk factors of all kinds, regardless of source, especially for populations at high risk.
- Restoration of the health or functional ability of those suffering illness or impairment of normal activities (secondary prevention). The aim here would be to increase the proportion of persons with unimpaired health, and to reduce the severity of disability of persons for whom restoration of completely unimpaired activity is not possible.
- Maintenance with dignity of life and of remaining functional ability where improvement is unlikely or impossible (tertiary prevention): the caring function of health care would be of predomiant importance here.

Of these three objectives, the prevention of premature death and disability seems to offer the greatest hope in terms of maximizing health expectancy. Additional gains in health expectancy should result from rehabilitation services for persons already impaired. In respect to the caring function of health care (irrespective of the prospects for improvement), the aim of meeting the basic needs of all Canadians for appropriate health care and social services should be seen not only as a means of achieving improved health expectancy, but also as an end in itself. Some services have intrinsic value quite apart from their effectiveness in prolonging life or restoring functional ability. In many circumstances, the provision of a caring, supportive environment may be more appropriate and more highly valued than the use of intrusive, high-technology interventions of doubtful value. Even in the most hopeless situations, the type of care provided should protect and preserve human dignity as well as life itself.

Monitoring the Healthfulness of Life

The goals and objectives referred to above should be expressed in quantifiable terms in order to allow monitoring of progress towards them over time. This implies the availability of relevant and timely data on each of the elements needed to effect the measurements. While a great deal of health-related data is now collected, it is not always well suited to these objectives, nor is it ordinarily put together in such a fashion as to permit the kind of comprehensive evaluation needed.

During the International Year of the Disabled, the House of Commons Special Committee on the Disabled and the Handicapped (Canada, 1981, p. 131) recommended "That the Federal Government direct Statistics Canada to give a high priority to the development and implementation of long-term strategy which will generate comprehensive data on disabled persons in Canada, using population-based surveys and program data." At present, however, one of the main data elements needed for the evaluation of population health status is once again missing—that concerning disability in the household population. The lack of data from periodic health surveys of the general population (as opposed to routine collection of administrative statistics on those receiving insured services) in turn reduces or destroys the potential value of much of the other routinely collected information, such as that related to the operation of the health-care system. To the extent that efficiency and effectiveness in the expenditure of public funds are valued, this situation is aberrant, uneconomical and unjustifiable.

If health goals are to be explicitly formulated and progress towards them monitored over time as a way of evaluating the success of health-related programs and policies, it is absolutely essential to have relevant and timely information on the state of health of the Canadian population as a whole, rather than just on the relatively small number of cases in which institutionalization or other insured professional services are received. A periodic survey of the health of Canadians is essential. We recommend the collection of such data every year, either as a separate survey or as part of a broader household survey.

Not all of the health survey questions would need to be repeated every year. But by regularly collecting at least the core data on disability, population health status could be monitored continuously. In addition, data from several years could be combined so as to permit a more detailed breakdown of the results than would be possible with single-year data unless sample size were increased severalfold.

Data accumulated over several years would permit the analysis to go beyond the level of broad generalizations useful for social scientists to the more specific analysis required by health planners and policy makers. This would permit estimates to be made of health and disability in the population not only for regional aggregates, but also for the provincial and sub-provincial areas at which health-care services are actually administered. It would also produce sample sizes sufficient to permit the breakdown of results by age group for the population aged 65 and over, where the bulk of long-term disability is concentrated. Moreover, it would produce the detail needed for the calculation of health expectancy by specific causes of death and disability, information that might lead to a complete rethinking of health priorities.

As part of an ongoing program of health surveys, special supplementary surveys could be conducted from time to time focusing on the health status and service needs of selected target groups, such as Indians, persons living in disadvantaged neighbourhoods, institutionalized populations or residents of remote areas.

Finally, future health surveys could be used to generate data on disability defined not only in terms of major and minor activities—as was the case in the 1978-79 survey—but also in terms of the amount of restriction in the basic activities of daily living. Besides providing a more "culture-free" measure of disability useful for comparative purposes, this approach would produce estimates of activity restriction that might more easily be related to potential service requirements at the local level.

The inclusion of one or two questions on the census concerning the presence or absence of any degree of activity restriction would permit subsequent follow-up surveys of the disabled population to be carried out more efficiently. Use of the 1981 census to screen for disability was recommended by the House of Commons Special Committee on the Disabled and the Handicapped, but this recommendation could not be implemented in time. Planning should begin immediately for the inclusion of such questions on the censuses of 1986 and 1991. In addition, use of the census for the collection of base-line data on institutionalization would provide a much needed link to help unify and verify the different sorts of data generated separately by household surveys and various categories of health-care institutions. The full coverage of the population provided by the census would aid greatly in the analysis of sample surveys and administrative data between censuses.

Some relatively minor modifications concerning the collection and organization of institutional data would markedly increase their usefulness in the evaluation of population health status:

- Beginning with the largest category of health-care institutions, the special-care facilities (which include nursing homes and similar services), it would be useful to have published estimates of the number and characteristics of residents for all such facilities known to be operating, rather than data only for those facilities that choose to complete and return the survey. Information on the level of care received by individuals within those institutions would be of considerably more use than the information now presented, which breaks down the institutional categories by predominant level of care provided in each facility. In addition, resumption of formal catalogued publication of the results of the survey of special-care facilities, including explanatory text and the estimates referred to above, would make this valuable information available to a much wider public than does the present informal form of distribution of unpublished tables to those who happen to become aware of their existence.

- Concerning hospitals and mental hospitals, the most important items of information now lacking are data on the age-sex distribution of patients actually in hospital (or of patient days of care received during the year). The information currently available is limited to persons admitted to or separated from hospital during the year, which may be relevant for short-stay units, but which is particularly ill suited in the case of the long-stay units of interest to us.
- As persons resident in institutions form a large proportion of the population at advanced ages, it would be highly desirable to supplement the regular household health surveys recommended above with occasional sample surveys of the institutionalized population. This would permit classification of the health status of persons in institutions on the same scale used to rate non-institutionalized persons. It would also allow more detailed information on their disability and socio-economic characteristics to be collected than would be possible on either a general population survey or regular administrative reports.

A major limitation of the data presently available is the almost total lack of information related to the socio-economic characteristics of persons dying during the year. Serious effort should be devoted to the collection and analysis of data related to the socio-economic determinants of mortality in Canada.

- There is a continuing need for the collection on death certificates of at least some basic socio-economic data such as that related to usual occupation, educational attainment, and census tract of residence.[1] The possibility of doing occasional linked record studies should not be considered a substitute.
- While greater use of census tract data or of presently unexploited occupational information, where this is available, should be possible, equal or better results might also be obtained by linking

a sample of death certificates back to previous census records. This approach has been used successfully in the United States (Kitagawa and Hauser, 1973), and should now be undertaken in Canada.

Support for Basic and Applied Research and Other Efforts Aimed at the Prevention and Treatment of Disabling Conditions

If additional funding were available for the purpose, many existing agencies and institutions could contribute to a concerted effort directed towards the prevention and treatment of disabling conditions. Federal and provincial governments should increase their support for basic and applied research in these areas, as well as for additional educational, informational and regulatory efforts directed to the same ends. The creation of a central body to co-ordinate such efforts might be useful. In this regard, the example of the recently formed Saskatchewan Institute on Prevention of Handicaps might be instructive (Saskatchewan, Task Force on Rehabilitation, 1980).

A combined analysis taking into consideration both causes of death and causes of disability would permit the ranking of health problems according to their overall impact on health expectancy, taking into account loss of functional ability as well as loss of life itself. We therefore recommend that additional work be undertaken by Statistics Canada in order to determine the loss of health expectancy due to each of the major causes of death and disability. In the course of this research, changes in data collection or coding procedures required to facilitate this objective should be identified, and suggestions made to resolve these and other problems encountered in this work.

In order to produce a health expectancy index that is more sensitive to newly emerging patterns of health and illness, three American researchers (Chen, Bush and Patrick, 1975) have demonstrated the usefulness of examining health transition probabilities rather than simply average rates of disability in each group. To do so, however, it is first necessary to determine the chances that persons in a particular state of health or disablity have of either improving or deteriorating over a period of time. A Markov-chain approach is then used to generate the information required for the determination of a modified form of health expectancy. Because of the potential utility of this approach for the formulation of more relevant and timely policies, Statistics Canada should study the possibility of using future health surveys for the collection of the missing health transition data, with a view to using these for the calculation of more sensitive indexes of health expectancy.

Information Requirements Related to Unmet Needs

While Canada boasts a highly efficient system of universal medical and hospital services, comparable services for the chronically ill or functionally disabled tend to be lacking. According to the House of Commons Special Committee on the Disabled and the Handicapped (Canada, 1981, p. 6), "In comparison with the efforts being made in other countries, Canada shows poor progress in assisting disabled persons in the areas of employment opportunities, income security, community support services, and technical aids."[2]

The Canadian Sickness Survey of 1950-51 provided many of the hard facts supporting arguments in favour of legislation establishing the universal hospital and medical care plans of the mid-to-late 1960s. These mainly provided hospital-based acute-care treatment and office-based professional services, while largely ignoring needs for other types of care. As a logical extension of past accomplishments, the results of the Canada Health Survey of 1978-79 and of the future surveys proposed above should now contribute to informed public debate relating to ways of assuring appropriate care for persons with long-term disabilities and chronic illnesses not necessarily requiring institutionalization or office-based professional treatment.[3]

Health data collection should be designed not only to monitor health status, but also to determine the extent and distribution of unmet needs relating to long-term disability and activity limitation. This type of information is essential to policy makers charged with the difficult task of translating health-related objectives into concrete programs of action.

Notes

1. The census records already contain much more detailed information on the socio-economic characteristics of persons than do the death certificates now, or indeed, than they could ever reasonably be expected to contain. The machine-readable summary of death records made available to Statistics Canada by all provincial authorities should contain sufficient personal identifying information to make such linkages possible using the automated methods now available.

2. A recent article on the problems of organizing appropriate services for "dependency groups" of various kinds (Illsley, 1981, p. 330) emphasized the different character of the needs of these persons compared to services provided by traditional medical treatment: "For the great majority of those with long-standing impairments or disabling conditions medical science has little further to give than the continuation of ameliorative treatment—their primary needs are for support in the activities of daily living from nurses or domestic workers, for material assistance, or for social and emotional nurturance."

3. Survey research (Institute for Behavioural Research, 1981, etc.) clearly demonstrates the overwhelming support of Canadians for universal, public medicine. It seems likely that this support is not limited to the particular programs presently funded, but is rather indicative of an underlying sentiment in favour of a broad range of policies designed to meet the basic needs of all Canadians for appropriate health care and health-related social services, irrespective of the specific form that such care might take in a given situation.

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APPENDIX

The following is a list of annexes produced during the preparation of the study.

To obtain copies of selected annexes, contact the Research and Analysis Section, Health Division, Statistics Canada, Ottawa K1A 0T6 (613) 995-7808.

ANNEX 0.1	Participants in the Healthfulness of Life mid-project panel seminar at The Institute for Research on Public Policy, Ottawa, September 8, 1981
ANNEX 0.2	List of persons contacted, Healthfulness of Life project, 1981
ANNEX 1.1	Abridged life tables, by sex, by province and region, Canada, 1977-1979
ANNEX 1.2	Abridged life tables, by sex, by community size, Canada, 1975-1977
ANNEX 2.1	Long-term institutionalization, by type of facility, by age and sex, by province and region, Canada, 1978 (average number of residents and percentage of population institutionalized)
ANNEX 2.2	Percentage distribution of hospital patient-days during the year, by type of unit (short-stay or long-stay), by province, Canada, 1977-78
ANNEX 2.3	Number and percentage of residents of reporting

	special care facilities classified as self-sufficient in Table 89 of "Selected Tables" for 1977-78, compared to number and percentage of residents so classified in special tabulation of 14 August 1981, by province, Canada, 1978
ANNEX 2.4	Approved beds in operating special care facilities compared to beds staffed and in operation in reporting special care facilities, by principal characteristic of predominant group of residents, Canada, March 31, 1978
ANNEX 2.5	Estimated number of residents in all operating special care facilities, and percentage distribution of residents, by level of care, by type of facility, Canada, 1978
ANNEX 3.1	Activity restriction in the household population, by severity of restriction, by age and sex, by region, Canada, 1978 (average number of persons and percentage of population restricted in activities)
ANNEX 3.2	Activity restriction in the household population, by age and sex, by community size, Canada, 1978 (average number of persons and percentage of population restricted in activities)
ANNEX 3.3	Activity restriction in the household population, by severity of restriction, by age and sex, by income level, Canada, 1978 (average number of persons and percentage of population restricted in activities)
ANNEX 3.4	Interviewer Administered Questionnaire, Section I-Two-Week Disability, Canada Health Survey, 1978-79
ANNEX 3.5	Interviewer Administered Questionnaire, Section V-Activity Limitation, Canada Health Survey, 1978-79
ANNEX 3.6	Duration of long-term disability among activity-limited persons in the household population, by sex, by severity of disability, Canada, 1978 (percentage of previous year limited in activities)
ANNEX 3.7	Duration of long-term disability among activity-limited persons in the household population, by age and

	sex, Canada, 1978 (percentage of previous year limited in activities)
ANNEX 3.8	Short-term disability in the household population, by presence or absence of long-term disability, by age and sex, Canada, 1978
ANNEX 4.1	Life table values used for the calculation of health expectancy, by region, community size, and income level, Canada, 1978
ANNEX 4.2	Effect of different weighting schemes on regional disparities in quality-adjusted life expectancy, by sex, Canada, 1978
ANNEX 4.3	Effect of different weighting schemes on community size disparities in quality-adjusted life expectancy, by sex, Canada, 1978
ANNEX 4.4	Effect of different weighting schemes on income disparities in quality-adjusted life expectancy, by sex, Canada, 1978
ANNEX 5.1	Health expectancy by age and sex, by region, Canada, 1978
ANNEX 5.2	Health expectancy by age and sex, by community size, Canada, 1978
ANNEX 5.3	Health expectancy by age and sex, by income level, Canada, 1978

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